DOE/OR/11-3037V4&D0

RCRA Part B Permit Renewal Application for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 4.

Appendix I-1 Closure Plan for the X-326 Unit
Appendix I-2 Closure Plan for the X-7725 Unit

Date Issued — February 21, 2000

Prepared by
EQ Midwest, Inc.
Cincinnati, OH
under subcontract 23900-SC-SM002F

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

This document has received the appropriate
reviews for release to the public.

Closure Plan for the X-326 Storage Unit

Portsmouth Gaseous Diffusion Plant

Date Issued — February 21, 2000
Page Revisions — July 11, 2000
Page Revisions — July 13, 2001

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SUBMISSION DATE: FEBRUARY 21, 2000

APPENDIX I-1

CLOSURE PLAN FOR THE X-326 UNIT

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Portsmouth Gaseous Diffusion Plant

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SUBMISSION DATE: February 21, 2000

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
COC	Chain-of-Custody
CPR	Cardiovascular Pulmonary Resuscitation
DAC	Derived Air Concentration
DBA	Decibel
dm	Decimeter
DOE	United States Department of Energy
DOT	United States Department of Transportation
dpm	Disintegrations per minute
EPA	United States Environmental Protection Agency
ESH	Environmental, Safety and Health
HASP	Health and Safety Plan
HWP	Hazardous Work Permit
ID	Identification
IDLH	Immediately Dangerous to Life and Health
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MPH	Miles per hour
Mrem/hr	Millirem/hour
MSDS	Materials Safety Data Sheet
MSHA	Mine Safety and Health Administration
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAL	Plant Allowable Limit
PCB	Polychlorinated biphenyl
PED	Plant Emergency Director
PELs	Permissible Exposure Limits
PID	Photo-ionization detector
PORTS	Portsmouth Gaseous Diffusion Plant
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAS	Quality Assurance Standard
RCRA	Resource Conservation and Recovery Act
rem	Units of radiation
RFD	Request For Disposal

SUBMISSION DATE: February 21, 2000

RFI	RCRA Facility Investigation
SCBA	Self Contained Breathing Apparatus
SOPs	Standard Operating Procedures
SSHO	Site Safety and Health Officer
SW-846	Publication of the U.S. EPA - Solid Waste Office
TAL	Inorganic Target Analyte List
TCL	Target Compound List
TLVs	Threshold Limit Values
TSCA	Toxic Substances Control Act
µCi/mL	Micro-Curie per milliliter
U.S. EPA	United States Environmental Protection Agency
UL	Underwriters' Laboratory
USCG	United States Coast Guard
U.S. GPO	United States Government Printing Office
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
"	inch
'	foot

CLOSURE PLAN FOR THE X-7725 STORAGE UNIT

1. FACILITY DESCRIPTION

1.1 General Description

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by DOE and is contractor managed by Bechtel Jacobs Company LLC. For the purposes of this permit application, DOE and Bechtel Jacobs Company LLC are Co-Operators of the X-326 and X-7725 Hazardous Waste Storage Units.

PORTS is located at 39°00'30" N latitude and 83°00'28" W longitude on a 3,714-acre federally owned reservation in Pike County, Ohio. Pike County, one of the state's lesser populated counties, encompasses an area of approximately 444 square miles. The site is located approximately equidistant between Chillicothe and Portsmouth, Ohio. The plant site is approximately 4 miles southeast of Piketon, Ohio, 1.5 miles east of U.S. Route 23, 2 miles east of the Scioto River, and 70 miles south of Columbus, Ohio (see Figure 1).

PORTS has operated since 1954, enriching uranium for national defense and commercial nuclear reactors. That enrichment is accomplished by the gaseous diffusion process. As of 1993, all uranium enrichment operations at PORTS are conducted by the United States Enrichment Corporation, formed as a government-owned corporation by the Energy Policy Act of 1992, that became private in July 1998. As such, DOE's mission at the PORTS site has changed to environmental restoration, waste management, removal of highly enriched uranium, and operation of nonleased facilities.

As a result of historical and current enrichment operations, and as is typical of large industrial plants, a wide variety of hazardous wastes are generated. These include analytical laboratory wastes, spent solvents, electroplating wastes, paint wastes, sludges, corrosive wastes, and environmental restoration generated wastes. Table 1 provides a listing of solid waste management units at PORTS.

The X-7725 Building was originally designed for Gaseous Centrifuge Enrichment (GCEP) activities. However, after GCEP was canceled in 1985, the X-7725 Building was selected as the site for hazardous waste container storage because it has a large area of floor space kept under climate-controlled conditions. The building consists of five floors with 20 acres of total floor space under roof. Approximately 9 acres of floor space are used for hazardous waste container storage activities. The building is divided into a number of rooms, staging areas, open bays, and offices (Fig. B-4).

The X-7725 Building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 11 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal downspouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled.

Wastes that may be stored in the X-7725 Building hazardous waste storage areas include any of the waste codes listed in Part A of this application.

All hazardous waste storage areas in the X-7725 Building have berms to provide for a secondary containment capacity of 10% of the total waste volume of hazardous waste stored and 25% of the total waste volume where RCRA/TSCA wastes are stored. The floor of the X-7725 Building is free of cracks and gaps and is sealed with a chemically resistant sealant.

1.1.1 Topographic Map

The U.S. Geological Survey (USGS) topographic map for the facility is shown on Attachment I-1. Topographic details of the X-7725 Storage Unit area are shown on Figure 3.

1.1.2 Solid Waste Management Units

All Solid Waste Management Units (SWMUs) at the PORTS facility are noted as such on Table 1 and the units are shown on Attachment I-2. A detailed description and list of the wastes managed and/or disposed at these units is found in the PORTS RFI Description of Current Conditions (DOCC) for Quadrants I-IV. Section 6 of the Quadrant III DOCC provides detailed information for the X-7725 facility. Appendix A of this closure plan contains the title page and table of contents for the Quadrant III DOCC.

1.2 Hydrogeologic Information

1.2.1 Geologic and Hydrologic Settings

The PORTS facility lies near the western margin of the Appalachian Highlands within the Appalachian Plateau Province. The physiography of this area is typified by rugged, irregularly dissected hills and ridges separated by generally mature drainage systems. The topographic highs are erosional remnants of the more competent units of the Paleozoic bedrock which underlie the area.

The facility lies to the south of the terminus of Pleistocene glaciation, however, two distinct physiographic features of glacial origin are present in the area. The most prominent of these features are large flat expanses of glacio-lacustrine deposits which fill preglacial topographic depressions. Deeply incised stream valleys which formed during periods of high flow resulting from glacial meltwater are also present locally.

Most of these valleys are partially filled with alluvial material and many are occupied by streams which are orders of magnitude smaller than the ones which originally formed the valleys.

The PORTS facility is situated on one of the glacio-lacustrine deposits formed when drainage of the preglacial Teays River was obstructed and prehistoric Lake Tight was impounded. Lake Tight occupied both the main Teays River valley and many of its tributary valleys, including the Portsmouth and Newark River valleys. Fine-grained sediments accumulated within Lake Tight, forming lacustrine deposits of silt and clay up to 50 feet thick. Figure 4 exhibits regional

1.3 X-326 Storage Unit Description

1.3.1 Waste Managed

The X-326 Storage Unit was designed and intended for the storage of high assay uranium bearing wastes until further processing for uranium recovery or treatment through a permitted process, such as an NPDES-permitted discharge. The wastes that may be stored in the X-326 Storage Unit include aqueous laboratory solutions, spent laboratory solvents, and decontaminated solutions from several other buildings on the plantsite.

Wastes stored in the X-326 Storage Unit may include:

D001	Ignitables
D002	Corrosive (acid and alkaline)
D004-D043	TC Characteristic
F001	
F002	
F003	
F005	

Radioactive RCRA Wastes
TSCA/RCRA Mixed Wastes*
Radioactive TSCA/RCRA Mixed Wastes*

* Note - Storage area will store PCB waste if waste is also RCRA hazardous.

The wastes are stored in DOT approved 5, 20, 30, 55 or 85 gallon containers, 5-inch cans or 10-liter polyethylene bottles. The drums are stored on steel supports, and the bottles are placed into support sleeves which are raised above the floor to prevent contact with potentially inadvertent standing liquid introduced into the area.

1.3.2 X-326 Storage Unit Description

The X-326 Storage Unit is located in the south end on the first floor of the X-326 process building. Attachment I-3 contains the floor plan for the X-326 Storage Unit. The X-326 building is totally enclosed with a built-up roof, transite walls and concrete floors. ~~Although heat is generated from the diffusion process, temperature is moderated with the use of large fans for ventilating the building.~~ HEATING AND COOLING IS PROVIDED AS NEEDED IN THE RCRA-PERMITTED STORAGE AREAS. The area around the building is sloped to direct run-on and run-off water to the PORTS storm sewer system.

Approximately 31,888 square feet of the X-326 is designated as storage space and will be used as required until final closure is initiated. The storage area dimensions and containment capacity for the six areas within the X-326 Storage Unit are delineated in Table 2.

Six waste areas in the X-326 building are delineated for storage: areas 1, 2, 3, 4, 5 and the "L" Cage (the "L" Cage consists of both the East Cage and the West Cage). Storage area floors for 1, 2, 3, 4 and 5 are sealed, primed and finished with a urethane-based sealant. The "L" Cage area has had any

existing concrete cracks (these were hairline cracks in the surface of the concrete and not significant structural faults) sealed with a polyurethane caulking sealant and recoated with one coat of chemically-resistant urethane sealant. All storage areas are surrounded by a 1" x 1" x 1/8" angle iron dike set in a chemically resistant elastomeric sealant. The floors are 0.8 feet thick and constructed out of concrete (Attachment I-4 provides a general cross-section of the X-326 building).

1.4 References to Other Environmental Permits

The PORTS facility operates in conformance with requirements established by a number of federal and state statutes and regulations, Ohio EPA Directors Findings and Orders, Executive Orders, DOE Orders, permits and/or submitted applications criteria, and compliance and settlements agreements. The PORTS facility maintains compliance status with regard to major environmental statutes under the following: Ohio EPA air permits and registered air emission sources; National Pollutant Discharge Elimination System (NPDES) permit 0IO00000; a Part B Permit; TSCA regulated storage areas; and Ohio State Fire Marshal Underground Storage Unit (UST) Registrations.

1.5 Anticipated Waivers or Exemptions

No waivers or exemptions are anticipated to be requested or required for the closure of this facility. The PORTS facility, including the X-326 Storage Unit, is owned by the U.S. Department of Energy, a Federal Agency.

1.6 Closure and Post-Closure Cost Estimates

In accordance with Ohio Adrninistrative Code (OAC) 3745-55-40(C), closure and post-closure cost estimates are not required for this Federal Facility.

1.7 Financial Assurance

In accordance with OAC 3745-55-40(C), financial assurance is not required for this Federal Facility.

1.8 Liability Coverage

In accordance with OAC 3745-55-40(C), liability coverages are not required for this Federal Facility.

2. CLOSURE PROCEDURES

The closure described in this plan is intended to minimize the need for further maintenance. It eliminates -- to the extent necessary to protect human health and the environment -- post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. Closure will be accomplished by the removal of waste and decontamination of the X-326 Storage Unit floors, diking and associated surfaces.

2.1 Estimate of the Quantity of Inventory to be Removed

The maximum capacity of the X-326 Storage Unit is delineated in Table 3. Wastes stored in the X-326 Storage Unit are discussed in Section 1.3.1.

2.2 Procedures for Handling Removed Inventory

All wastes removed from the facility will be stored on-site at X-7725, shipped off-site for treatment and/or disposal, or treated on site. All wastes will be disposed in strict compliance with all applicable environmental regulations. Any wastes removed from the facility for disposal will be removed in an acceptable manner to transportation vehicles appropriate for waste transport. All transportation will take place via hazardous waste transporters registered with the Public Utilities Commission of Ohio and U.S. EPA and possessing a registration number from each of these entities. All waste disposed will be manifested using the uniform hazardous waste manifest (U.S. EPA form 8700-22 and 8700-22A) in accordance with Ohio Administrative Code 3745-52-20 before transportation off-site.

2.3 Procedures for decontamination and Disposal

2.3.1 Surface Decontamination

The X-326 Storage Unit storage area surfaces consist of urethane painted/coated concrete surfaces and associated 1" x 1" x 1/8" angle iron diking. The urethane material is extremely resistant to chipping and cracking. Structural joints are filled with a caulking which is also extremely resistant to cracking.

Each of the six storage areas of the X-326 Storage Unit will be decontaminated as discussed herein. Those areas where PCB and PCB contaminated waste were stored will be sampled for PCBs to determine if PCB contamination exists. Standard 100 cm^2 wipe samples will be randomly collected in accordance with 40 CFR 761.125 (PCB Spill Cleanup Policy). Additional samples will be collected from areas that appear stained as identified by a certified professional engineer. Any areas exhibiting PCB contamination above 10 $\mu g/100\ cm^2$ will be decontarminated according to procedures specified in 40 CFR 761.125 before undergoing RCRA decontamination. Prior to decontamination of a storage area, the area will be divided into zones for decontamination verification. Before decontamination procedures begin, a certified professional engineer will determine the perimeter of the zones based upon visual inspection. Areas of apparent surface staining, contamination or structural faults will be noted for special evaluation in zone and/or

sampling consideration. The inner and outer surfaces of the 1" diked outer periphery of the storage areas will be decontaminated. Decontamination zones will be limited in size in these areas to accommodate the decontamination technique utilized. Washwater in these areas will be immediately collected to ensure it does not migrate from areas being decontaminated. Sorbent material will also be placed on the floor approximately 1 foot from the outer edge of the 1" dike and utilized as diking to eliminate wastewater migration. Any floor drains in these areas will be temporarily sealed to prevent migration. To decontaminate the X-326 Storage Unit, personnel will use a brush, mops, and/or a high pressure hot water spray to wash down the floor. All decontamination procedures will strictly adhere to the health and safety requirements outlined in the X-326 Storage Unit HASP (Section 4.0). Minimal detergent solutions will be used to facilitate the proposed treatment of any generated liquid waste. As the floor is cleaned, the liquid spray will be collected and placed into containers. The areas where the contaminated material and liquid wastes are transferred to containers will be curbed and overlain with Visqueen or equivalent plastic sheeting to provide spill containment.

Chemical analysis of the final rinseate will be used to determine if sufficient decontamination of the surfaces has taken place. A final rinseate sample for analysis will be collected from each of the divided zones. The liquid rinseate will be analyzed for the parameters listed in Table 4. The X-326 Storage Unit surfaces will be considered clean when concentrations of liquid hazardous waste or hazardous waste constituents fall below:

a) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous waste constituents as listed in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics;

b) If an MCL is not available for a particular contaminant, then fifteen times the maximum contaminant level goal (MCLG) as listed in 40 CFR 141.50 shall be used as the clean standard; and

c) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor an MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

If the analysis indicates contamination still exists on the floor, the decontamination procedure will be repeated. If analysis indicates contamination still exists, the contaminated floor areas may be subjected to scabbling or a similar procedure to remove the contamination. If scabbling or a similar procedure is necessary, steps to rninimize or eliminate fugitive dust air emissions as discussed previously will be taken. Debris removed will be placed into containers and disposed as discussed in Section 2.3.2.

A maximum volume of 5,000 gallons of rinseate/wastewater is estimated to be generated by the above processes.

All workers involved in decontamination of the X-326 Storage Unit surfaces will comply with the health and safety procedures outlined in the X-326 Storage Unit Closure HASP contained in Section 4.0.

2.3.2 Solid Treatment or Disposal

At completion of closure for the X-326 Storage Unit, all non-disposable equipment including power tools, hand tools, hoses and other miscellaneous equipment will be decontaminated in a previously constructed decontamination area that is curbed and overlain with Visqueen or equivalent plastic sheeting to provide containment following the procedures outlined in Appendix C.

Disposable equipment and supplies generated during the X-326 Storage Unit closure will not be decontaminated but will be placed into 55-gallon DOT 17C open top drums or other structurally competent DOT approved containers on a daily basis. At project completion, all containers with disposable equipment/supplies will be disposed at an off-site facility in accordance with all applicable disposal regulations (e.g., RCRA, TSCA, NRC) or stored on-site pending disposal. Any additional solids removed such as concrete, paint chips, sealant pieces will be subjected to laboratory waste characterization and disposed as hazardous waste or as low-level radioactive waste, depending on the radioactivity of the material. It is estimated a total of 2,000 pounds of wastes will be generated in the above processes.

2.3.3 Rinseate Treatment or Disposal

All liquid wastes generated during the X-326 Storage Unit closure will be managed initially as hazardous waste. Each drum of rinseate/wastewater generated during decontamination will be tested for parameters listed in Table 4 to document the extent of contamination and insure levels are acceptable for treatment described herein. Rinseates will then be managed as a wastewater and treated through one of the facility's NPDES permitted treatment systems. Rinseate will be managed in strict compliance with the Clean Water Act. It is estimated a maximum of 5,000 gallons of liquid waste will be treated in this manner.

Rinseate may also be managed as a radioactive waste and not discharged to an NPDES treatment system depending on the radioactivity, if any, of the rinseate.

2.3.4 Soil Sampling and Analysis Program

Because the X-326 Storage Unit storage floor surface areas consist of a layer of concrete one feet thick, it is extremely unlikely that a crack could develop that would allow migration of wastes to soils below. Therefore, no soil sampling will be conducted as part of this closure. If structural cracks are discovered, PORTS will immediately contact the Ohio EPA to discuss amending the closure plan.

2.4 Description of Security System

PORTS is a controlled access facility with fencing, gates, and numerous other features that contribute to the safety and security of the facility. Security is maintained by a staff of trained security guards 24-hours a day. Routine patrols of areas outside the main complex are conducted at a minimum of once every eight hours. All security guards are equipped with two way radios and have direct communication with other protection personnel (i.e. fire department, shift superintendents, and the plant communications center). Employees are required to show

identification badges when entering all main complex gates. Visitors and contractors entering the main complex must sign a log sheet and/or obtain proper passes.

2.5 Closure Certification

Within sixty (60) days of final closure, the owner/operator and an Independent Certified Professional Engineer will submit a certification of closure to the Ohio EPA Director by registered mail, assuring that the closure has been performed and is in accordance with the approved closure plan.

2.5.1 Activities to be Conducted

The performance standards to be used in evaluating activities proposed in Section 2.2 and 2.3 are the detection limits of the individual hazardous chemicals. Samples will be collected from decontamination rinseate.

2.5.2 Testing and Analysis to be Performed

The sampling and analysis protocol for activities proposed in Section 2.2 and 2.3 will generally follow the requirements of SW-846 and the SOPs in Appendix C. All laboratory sample analytical methods will follow a specific quality assurance and quality control plan.

2.5.3 Criteria for Evaluating Adequacy

The activities proposed in Section 2.2 and 2.3 will be evaluated by an Independent Certified Professional Engineer. The Independent Certified Professional Engineer will be required to submit a report of findings and recommendations.

2.5.4 Schedule of Inspections

The areas where the activities proposed in Section 2.2 and 2.3 are to be conducted will be inspected by the independent engineer routinely. Upon the beginning of closure operations, the independent engineer will notify the Ohio EPA (District and Central Office) five days prior to any critical activity and will inspect all closure activities on a daily basis. All observation and inspection activities will be recorded in the engineer's log book. This schedule will continue until the activity has been completed, all hazardous waste has been removed, any contaminated soil or rinsewaters have been removed, and the sampling protocol has been completed. In addition to the closure performance inspection, PORTS health and safety, and building custodian personnel will be inspecting the X-326 Storage Unit closure area.

2.5.5 Types of Documentation

Documentation which will be included in the closure certification report will include the sample analysis information, volume of waste generated during closure, waste records, spill/leak reports, all sample and decontamination procedures documentation (Chain-of-Custody (COCs), sampling logs, etc.), routine and special inspection records, photography, the approved closure plan and other

related documents. In addition, the closure certifications report will contain any correspondence with outside agencies and independent evaluations which relate to the closure activity.

3. CLOSURE SCHEDULE

3.1 Expected Year of Closure

The X-326 Storage Unit is expected to undergo closure in the year 2041 upon notification of intent to close according to the schedule outlined in Table 5.

3.2 Frequency of Partial Closure

Partial closure of one or more of the six storage areas within the X-326 Storage Unit may occur prior to the expected year of closure.

3.3 Waste Removal

The X-326 stored hazardous waste will be shipped to a permitted treatment, storage, or disposal facility or transferred to an on-site storage facility. Aqueous mixed waste may be treated on-site. Any remaining waste at the time of closure will be removed accordingly. The schedule for waste removal is illustrated in Table 5.

3.4 Closure Completion

Closure is expected to be completed within 180 days of beginning closure under an Ohio EPA approved plan. Although no time extension requests are anticipated, if one should become necessary, it will be requested in accordance with demonstration requirements specified in OAC 3745-66-13.

3.5 Certification of Closure

Within 60 days of successful completion of the prescribed closure, the Department of Energy will submit to the Director of the Ohio EPA, by registered mail, a certification that the X326 unit has been closed in accordance with the specifications in the approved closure plan. In addition, the Regional Administrator, U.S. EPA Region V will be sent a copy. The certification statement will include the exact wording found in OAC 3745-50-42(D). The certification will be signed by the owner and by the Independent Certified Professional Engineer responsible for closure overlie, registered in the State of Ohio.

3.6 Survey Plat

Since the closure of the X-326 Storage Unit is expected to be "clean," filing a survey plat is not expected to be required. Should it be determined that a clean closure cannot be accomplished, the Department of Energy will immediately contact the Ohio EPA to discuss amending the closure plan. If it becomes necessary, a survey plat will be submitted to the Pike County Recorder's Office and the Director of the Ohio EPA, which indicates the location and dimensions of the unit with respect to permanently surveyed benchmarks. The plat would be prepared and certified by a professional land surveyor. The plat would contain a note, prominently displayed, which states the owners obligation to restrict disturbance of the hazardous waste unit.

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3.7 Request for Extension to Deadlines for Handling Inventory or Completing Closure

There are no extensions needed at this time.

3.8 Milestones

Table 5 exhibits the time required for each phase of the X-326 Storage Unit closure.

4. HEALTH AND SAFETY PLAN

A general Health and Safety Plan (HASP) has been developed for closure of the X-326 Storage Unit at PORTS. The HASP presents the procedures to be followed which will achieve compliance with applicable federal, state and local regulations.

Prior to commencement of any closure field activities, a detailed and site specific HASP will be required to be submitted by the contractor selected to perform these closure activities. The site specific HASP will include but is not limited to the following general requirements.

- DOE orders (e.g., 5480.4, 5480.10 and 5480.11)
- Code of Federal Regulations (e.g., OSHA 29 CFR, EPA 40 CFR, and DOT 49 CFR)
- ACGIH threshold limit values (TLVs), latest edition
- Standard practice procedures for health and safety

This HASP will be available at PORTS for inspection by employees, their designated representatives, DOE, EPA and other authorized personnel. Specific safety and health hazards of each phase of site investigation operations and the requirements and procedures for employee protection will be provided in the site safety and health plan. The site safety and health plan complies with 29 CFR 1910.120 and must be developed and approved prior to hazardous waste operations. As a minimum, the site safety and health plan addresses the following items:

- Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer;
- Site characterization and analysis;
- A safety and health risk analysis of each site task and operation;
- Employee training;
- Selected engineering controls, administrative controls and work practices to be implemented;
- Personal protective equipment to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment used;
- Site control measures;
- Decontamination procedures;

- Site's standard operating procedures;
- A contingency plan meeting the requirements of paragraph (1) of 29 CFR 1910.120 for safe and effective responses to emergencies including the necessary personal protective equipment and other equipment; and
- Confined space entry procedures.

4.1 Objectives

This general HASP contains the requirements for protection of on-site personnel and the public during closure of the X-326 Storage Unit at PORTS.

The protection of individuals and the environment are major concerns during any project involving potentially hazardous substances. The objective of this HASP is to assure that safe working conditions exist at the site during the field activities. Adopted safety measures and procedures have been based on an analysis of potential hazards at PORTS.

This HASP has been developed based upon a review of the requirements and guidelines described in the EPA Standard Operating Safety Guide, U.S. Department of Labor OSHA Standards 29 CFR Part 1910 (especially, 29 CFR 1910.120 covering hazardous waste operations), NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (U.S. Department of Health and Human Services Publication No. 85-115). Subcontractors will be given copies of this general HASP and will be required to follow the procedures and protocols specified herein for development and implementation of specific site safety and health plans.

Requirements of this general HASP and associated site safety and health plans may be modified, in writing, in response to review of changing site conditions upon approval by PORTS Environmental, Safety and Health (ESH) and the Site Safety and Health Officer.

4.2 Responsibilities

All closure operations which might expose personnel to site contamination are subject to this HASP. Avoiding adverse health effects and injuries to the site workers and preventing environmental insult are dependent on the contribution of all project participants.

4.2.1 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) will be responsible for providing technical coordination of the health and safety program. The officer will review documentation on medical programs and training requirements to be certain that personnel fulfill OSHA requirements. After review of the site safety and health plan's hazard assessment, the health and safety officer will select appropriate air monitoring engineering controls, work practices and personal protective equipment for particular work areas. Daily activities and site access are monitored to assure that all applicable procedures are followed. Representatives of PORTS ESH and the EPA will oversee issues relating to health and

safety. The officer provides authorized personnel with the HASP-related documentation which must be available at all work sites. This documentation includes the following:

- A copy of the physician's written opinion for each employee;
- A copy of training records, which document that each employee has completed the necessary training to accomplish the job to satisfy applicable 29 CFR and 40 CFR requirements, and is trained in the use of respiratory protection equipment;
- Documentation of the fit-testing program for respiratory protection equipment (meeting the requirements of OSHA 1910.134 and the American National Standards Institute (ANSI) Z88.2-1980);
- Job-specific (e.g., drilling, drumming waste, etc.) air monitoring records;
- A copy of this HASP and appropriate site safety and health plans; and
- Assurance that operators possess current licenses/certificates to operate motorized equipment.

The SSHO will communicate the specified safety-related requirements to all personnel during the daily safety meeting. Pre-entry briefings are held prior to initiating any site activity and at other times as necessary to ensure that employees are informed of and follow the site safety and health plan.

4.2.2 PORTS ESH

PORTS ESH is ultimately responsible for ensuring that all project participants abide by the requirements set forth in this plan. Approval of each site safety and health plan must be granted by PORTS ESH prior to initiating site operations. No individual may enter a hazardous waste site unless authorized by PORTS ESH to have site access. Such access is dependent upon presentation of satisfactory documentation including a physician's written opinion and necessary training.

PORTS ESH performs periodic audits to assure field implementation of the general HASP and site safety and health plans and reviews air and personal exposure monitoring results.

Disputes over health and safety issues will be resolved by PORTS ESH and the SSHO prior to submitting a modified HASP to Ohio EPA and U.S. EPA for review. The Ohio EPA and U.S. EPA shall also be kept informed of all changes made to the HASP.

4.2.3 Field Personnel

Field personnel must be properly trained in health and safety regulations associated with handling hazardous materials and are responsible for adherence to the safety procedures during performance of the work. In no case may work be performed in a manner that conflicts either with the intent of these procedures or with the inherent safety and environmental cautions expressed. After due

warnings, any personnel who violate safety procedures will be dismissed from the site.

4.3 Hazard Evaluation

Site-specific hazard evaluations of substances known or suspected in the X-326 Storage Unit will be included in the site specific safety and health plan and reviewed prior to initiation of field activities. Appropriate personal protection levels, specific safety measures, and other pertinent information to be employed for the X-326 Storage Unit closure will also be presented in the site specific health and safety plan.

4.3.1 Radiological Hazards

Radioactive materials emit one or more of four types of potentially harmful radiation: (alpha, beta, gamma and neutron). Alpha radiation has limited penetrating ability and is usually stopped by clothing and outer layers of the skin. Alpha radiation poses little threat outside the body, but can be hazardous if materials that emit alpha radiation are inhaled or ingested. Beta radiation can cause harmful "beta burns" to the skin and change the subsurface blood system. Beta radiation is also hazardous if materials that emit beta radiation are inhaled or ingested. Use of protective clothing, coupled with scrupulous personal hygiene and decontamination, afford good protection against alpha and beta radiation. In addition, use of respiratory and other protective equipment can help keep radiation-emitting materials from entering the body by inhalation, ingestion, injection, or skin absorption.

Gamma and neutron radiation easily pass through clothing and human tissue and can also cause serious permanent damage to the body. Chemical-protective clothing affords no protection against these types of radiation.

A PORTS health physicist will be consulted prior to work. At dosage-rate levels greater than 2 millirem per hour (mrem/hr) (whole body gamma radiation), all site activities shall cease until the situation has been assessed and appropriate health and safety measures have been implemented.

All workers will submit baseline and exit bioassay urine samples for total uranium, gross alpha and technetium-99. The urine specimen will represent at least a full 24-hour period. The minimum acceptable volume is 1.0 liter. Monthly specimens for the routine bioassay program will be collected on Friday or the last day of the workshift. Additional uranium bioassay samples will be collected whenever an intake above plant allowable limits may have occurred.

The purposes of the bioassay program are to confirm the results of the air sampling program and confirm the effectiveness of the respiratory protection program.

4.3.2 Chemical Hazards

Material Safety Data Sheets will be available at the job site for those chemicals utilized during closure. The SSHO will assist in identifying technical chemical hazard issues that are not addressed or are unclear on the Material Safety Data Sheets.

4.3.3 Physical Hazards

Physical hazards on the site include electric shock, tripping, falling, noise, and heat stress. To ensure a safe work place, the SSHO will conduct and document daily safety meetings and inspections. The SSHO must be familiar with OSHA construction industry and general industry standards. The SSHO shall ensure that all workers are informed of any physical hazards related to the site.

4.3.3.1 Heavy Equipment

Some general safety concerns include:

- Follow established procedures;
- Get help whenever you are in doubt about a material's weight. Use the buddy system;
- Be sure that any gas cylinders are secured properly to heavy mobile equipment;
- Hard hats and safety glasses are to be worn at all times around heavy equipment. Additional protective gear will be worn as needed;
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators;
- Only qualified/licensed people are to operate heavy equipment;
- Use chains, hoists, straps, and other safety equipment to aid in moving heavy materials consistent with hoisting and rigging standards;
- Never walk directly in back of or to the side of heavy equipment without the operators knowledge; and
- Be sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines will present a hazard in the work area.

4.3.3.2 Trenching

Not applicable.

4.3.3.3 Electrical

All electrical wiring used during the X-326 Storage Unit closure activities will satisfy the requirements of 29 CFR 1926, Subpart K, and any applicable local electric codes. Some specific electrical safety requirements follow:

- All electrical work will follow established procedures;

- All wiring will be done by a licensed electrician;
- All extension cords must have functional grounding conductors;
- All equipment that is not "double insulated" must have a functional grounding conductor;
- All electrical cords must be in good condition;
- In lieu of a documented "assured equipment grounding conductor program," ground fault protected circuits can be utilized; and
- Electrical cords and power tools will be inspected by the SSHO prior to use on the X326 Storage Unit closure. Workers will inspect their power tools and cords.

4.3.3.4 Tripping and Falling

Workers will be apprised of any potential trip hazards through daily tool box health and safety meetings.

Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to workers will be corrected as soon as they are identified.

4.3.3.5 Utilities and Powerlines

Not applicable.

4.3.3.6 Noise

Workers will be protected from excessive noise exposure through equipment maintenance, noise monitoring, and hearing conservation programs which comply with 29 CFR 1910.95. The daily equipment inspection will include the exhaust system; perforated exhaust pipes and mufflers will be replaced as they are discovered. Noise level surveys in work areas and around equipment will be performed regularly and documented.

Hearing protective equipment will be required whenever continuous noise levels equal or exceed 85 DBA (slow meter response) and/or impulse/impact noise exceeds current ACGIH TLVs or OSHA 1910.95.

4.3.3.7 Heat Stress

Wearing Personal Protective Equipment (PPE) puts a hazardous waste worker at risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other precautions are vital.

Heat stress may be of concern especially when the dry-bulb air temperature exceeds 70 °F. One or more of the following control measures can be used to help control heat stress if ambient temperatures above 70 °F are expected:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salt lost from sweating. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement;

- Replacement fluids can be a 0.1 percent salt water solution, commercial mixes such as Gatorade or Quick Kick, or a combination of these and fresh water;

- Establishment of a work regimen that will provide adequate rest periods for cooling down. This may require additional shifts for workers or earlier/later work schedules;

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments;

- All breaks are to be taken in a shaded rest area;

- Employees will remove impermeable protective garments during rest periods;

- Employees will not be assigned other tasks during rest periods; and

- To prevent heat stress, all employees will be informed of the importance of adequate rest, acclimatization, proper diet, health hazards, recognition of heat illness, and first aid.

Because the incident of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

- For workers wearing permeable clothing (e.g., standard cotton or synthetic work (clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Govermnental Industrial Hygienists' (ACGIH) threshold limit values for heat stress. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.

- For workers wearing semipermeable or impermeable encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70 °F.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third; or,

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.

  If oral temperature still exceeds 99.6 ° F at the beginning of the next rest period, shorten the following work cycle by one-third.

  Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

To monitor body water loss, measure weight on a scale accurate to +0.25 lb. at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and level of physical work. The length of work cycle will be governed by frequency of the required physiological monitoring.

4.3.3.8 Cold Stress

Cold stress may be of concern, especially when a wind-chill-adjusted temperature of 10 ° F or less is expected. To control cold stress:

- Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body or result in profound generalized cooling, causing death. Areas of the body which have high surface-area-to-volume ratios such as fingers, toes, and ears, are the most susceptible;

- Two factors influence the development of cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 ° F with a wind of 15 miles per hour (MPH) is equivalent in chilling effect to still air at -18°F;

- As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked;

- Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- Frostbite nip or initial frostbite: Characterized by sudden blanching or whitening of skin;
- Superficial frostbite: Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
- Deep frostbite: Tissues are cold, pale, and solid; this is an extremely serious injury.
- Systemic hypothermia is caused by exposure to freezing and rapidly dropping temperature. Its symptoms are visually exhibited in five stages: (1) shivering, (2) apathy, listlessness, sleepiness, and sometimes rapid cooling of the body to less than 95 °F, (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate, (4) freezing of the extremities, and finally, (5) death.
- Thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear can aid in the prevention of hypothermia.
- Blankets, warm drinks (other than caffeinated coffee) and warm break areas are essential.

4.3.3.9 Illumination

While work is in progress, areas accessible to employees will be illuminated not less than the intensities identified on the table located on page 4-10.

4.3.3.10 Sanitation

Provision of potable water, drinking cups, non-potable water, toilet facilities, washing facilities and other sanitation requirements will be in compliance with specifications of OSHA 1910.120 (n).

4.3.3.11 Bodies of Water

Not applicable.

4.3.3.12 Confined Space Entry

All employees required to enter into confined spaces shall observe requirements specified in ANSI Z117.1-1977 (or the latest revision thereof) and PORTS SPP H-53, "Confined Space Program." Prior to entry, employees shall have satisfactorily completed a confined space training program. Depending upon risk level, atmosphere testing for oxygen deficiency, combustible gases and toxic agents may be required. High risk entries require issuance of a hazardous work permit (HWP) by the PORTS facility custodian prior to job activities.

4.3.3.13 Site Housekeeping

Construction debris shall be handled in accordance with OSHA 1926.25.

MINIMUM ILLUMINATION INTENSITIES

FOOT-CANDLES	AREAS OR OPERATIONS
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling and field maintenance areas.
5	Indoors: warehouse, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine safety and health administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

* Table 120.1 of 29 CFR 1910.120 provides additional technical information on illumination intensities.

4.4 Air Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed at each work site. Initial air monitoring will be conducted to identify any Immediately Dangerous to Life and Health (IDLH) and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials. Then, periodic monitoring will be conducted when

- Work begins on a different portion of the site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling); and
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

4.4.1 Radioactive Materials

Radiation and radioactive contamination will be monitored using survey instruments capable of measuring low levels of activity.

Initially, at least one breathing zone air particulate sample for the employee with the highest potential exposure will be collected per work crew per work shift during activities at the site. As results are obtained, it is anticipated that the frequency of sampling during a particular activity can be reduced. The criteria for air particulate sampling and radio nuclide counting are addressed in DOE Order 5480.11.

Radioactive air particulate samples will be counted using a gas proportional counter, or alpha scintillation counter or counter with similar capabilities. As a minimum, gross alpha emitter airborne concentration and gross beta emitter airborne concentration will be determined and documented.

Preliminary samples showing activities above 25% of applicable DAC values will be composited and sent to a laboratory for identification of the isotopes present and their concentrations. In addition, whenever the time weighted average gross alpha or gross beta airborne concentration measurements indicate that airborne radio nuclide concentrations may exceed 25% of the values provided in DOE Order 5480.11, isotopic analysis will be performed. When appropriate, several filters may be submitted as a single composite sample for isotopic analysis.

4.4.2 Chemical Hazards

Air sampling and monitoring for chemical hazards will be conducted to the extent necessary to document compliance of the project with existing regulations. Monitors used will include

direct-reading instruments and sample collecting devices. Direct reading instruments to be used during the X-326 Storage Unit closure activities may include photo ionization detectors, flame ionization detectors, colormetric tube samplers, and combustible gas/oxygen meters; sample collecting devices utilized may include filter cassettes, florisil tubes and charcoal tubes. Breathing zone samples for employees with the highest potential exposure for each contaminant will be initially taken at a minimum rate of one per work crew per shift until results obtained indicated a greater or lesser sampling frequency is warranted.

Caution must be exercised when utilizing direct-reading instruments. Since mixtures of chemicals may be encountered and direct-reading air monitoring instrument may react to the total mixture, individual concentrations of specific compounds may not be determined by these instruments. Direct-reading instruments are not to be used when negative interference is a possibility. For situations involving exclusively positive interference, it will be assumed that the mixture is made up entirely of the chemical with the lowest airborne exposure limit. This means that the composite reading obtained will be compared with lower applicable value of the ACGIH TLVs or OSHA PELs for that specific substance to determine required respiratory protection levels.

Site hazard evaluation is a dynamic and on-going process. Respiratory protection levels may change based on measured atmospheric concentrations of detected contaminants. Respiratory protection levels will be re-evaluated if chemical analytical results from samples collected during the field activities indicated that such re-evaluation is warranted; i.e., if additional compounds are detected or if airborne concentrations significantly differ from previous measurements. The results of the air monitoring will be used as on-site documentation of contaminant exposure levels and to select the appropriate level of personal protective equipment.

4.4.3 Physical Hazards

Monitoring for physical hazards will consist of on-site inspections and use of direct-reading instruments. These instruments may include sound level meters, noise dosimeters, various types of thermometers, radio frequency analyzers, illumination meters and thickness gauges.

4.4.4 Equipment Calibration and Maintenance

All monitoring equipment will be calibrated and maintained according to manufacturer's instructions.

4.5 Personal Protective Equipment

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated, or when direct contact with skin-affecting substances may occur. Full-face respirators protect lungs, gastrointestinal tract, and eyes against air toxicants. Chemical-resistance clothing protects the skin from contact with skin-destructive and absorbable chemical. Good personal hygiene limits or prevents ingestion of material.

Equipment to protect the body against contact with known or anticipated chemical hazards has been

divided into four categories according to the degree of protection afforded as outlined in OSHA 1910.120, Appendix B.

- Level A: Chemical-protective, totally-encapsulating suit; NIOSH-approved, full-face piece Self Contained Breathing Apparatus (SCBA) or combination SCBA/air line; chemical-resistance inner and outer gloves; chemical-resistant boots with steel toes and shanks; disposable protective suit, gloves and boots; and two-way radios. Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- Level B: Chemical-resistance splash suit and coveralls (e.g., PVC saranex); NIOSH approved, full-face piece SCBA or combination SCBA/air line; chemical-resistance inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection or when the atmosphere contains less than 19.5% oxygen.

- Level C: Chemical-resistant splash suit and coveralls; NIOSH-approved, full-face cartridge respirators; chemical-resistant inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the types of airborne substances are known, the concentrations measured, direct contact with exposed skin poses no hazard and the criteria for using air-purifying respirators are met.

- Level D: Coveralls (cloth), boots (leather or rubber) with steel toes and shanks, chemical resistant outer boots; and hard hat. This is primarily a work uniform providing rninimal protection for situations when the atmosphere contains not known hazard. Optional items include face shield, safety glasses or goggles; gloves; and hearing protectors.

4.5.1 Respiratory Protection

The selection and use of respirators will be in accordance with the publications listed below:

- ANSI Z88.2 (1980) "Practices for Respiratory Protection."

- NIOSH/OSHA/USCG/EPA (1985) Occupational Health and Safety Guidance Manual on Hazardous Waste Site Activities. US GPO, Washington, D.C.

- 29 CFR 1910.134, "Respiratory Protection."

- 29 CFR 1926.58, "Asbestos."

The following requirements will be adhered to:

- As a minimum, only properly cleaned, maintained, NIOSH/MSHA-approved full-face air purifying respirators will be used on-site;

- Selection of respirator, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the SSHO;

- Air-purifying cartridges will be replaced on a regular basis, as determined by the SSHO;

- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of a respirator. All respirator users are required to have physicals annually with the most recent physician's written opinion permitting respirator use;

- Contact lenses are not to be worn while using any type of respiratory protection;

- Air-line respirators shall be assembled according to manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc. Though not anticipated, air-line respirators may need to be used on-site;

- Excessive facial hair (for example, beards) prohibits proper face fit and effectiveness of respirators. Persons required to wear full-face piece respirators of SCBAs must not have interfering facial hair. All personnel wearing full-face piece respirators of SCBAs will be required to be shaven to permit proper fit;

- Regular eyeglasses cannot be used with full-face respirators (they can break the facepiece seal). Inserts must be utilized;

- The respiratory protection program utilized on-site will be documented and in compliance with OSHA, 29 CFR 1910.134 and ANSI Z88.2-1980. This requires annual respirator-usage training and annual fit testing of the respiratory equipment (fit testing every 6 months if asbestos exposure is a possibility). Program documentation and employee records for training and fit testing must be reviewed and approved by ESH; and

- Where respirators are designated for protection against contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance, contaminant odor breakthrough, or other malfunction is experienced.

Based on the hazard evaluation the use of respiratory protection is anticipated to be limited for the majority of tasks involved. Level D protection (with the modifications listed in Section 4.5.2 of this HASP) has been selected for site activities unless on-site monitoring data indicates a necessity for upgrading personal protective equipment. Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the initial and ongoing job appropriate level(s) of employee protection. These monitoring procedures are discussed in Section 4.4 of this HASP (air monitoring).

4.5. Protective Clothing

Based on available health and safety information, initial protective clothing for this work shall be as follows:

- Disposable acid-resistant coveralls with hood and boot covers;
- Boots (leather or rubber) with steel toes and shanks;
- Chemical-resistant outer boots;
- Hard hat, as applicable;
- Latex inner gloves;
- Chemical-resistant outer gloves or equivalent;
- Hearing protection, as applicable;
- If not wearing a full-face piece respirator or SCBA, chemical splash goggles will be worn at all times in the work area. Contact lenses will not be permitted in the contaminated area; and
- Sleeves will be taped to gloves and cuffs taped to boots, as applicable.

Upgrading or downgrading of the selected level of protective equipment will be the decision of the SSHO based on assessment of potential hazards.

4.6 Site Control

A site control program which meets requirements specified in OSHA 1910.120(D) will be included in the site safety and health plan.

Appropriate warning signs will be posted in readily visible locations in or near contaminated work areas. Inadvertent entry by unauthorized personnel will be prevented by utilizing barricade tape to mark the boundaries of hazardous waste sites within the PORTS security fence.

Access to contaminated work areas will be restricted to persons authorized by ESH. A daily roster containing the date, the person's name, the person's signature, organization, the time of entry, and the time of exit will be kept of all persons working in such areas. Any visitors to the area must present proper identification and be authorized to be on site. Visitors must comply with all aspects of the HASP.

Each restricted access area at PORTS will be divided into three zones, an exclusion zone, a decontamination zone, and a support zone. The basic premise behind this type of procedure is to limit the transportation of contaminants to clean areas by confining and controlling activities.

4.6. Exclusion Zone

The exclusion zone includes the actual work area where contamination is likely to be the highest. This zone has the higher inhalation exposure potential and/or presents a potentially higher

probability of skin contact with cutaneous or percutaneous effecting chemicals. As its name implies, access to the exclusion zone is limited, and the exclusion zone is bounded by an access barrier. The exclusion zone is entered after donning the proper equipment and passing through the contaminant-reduction zone. The exclusion zone should be large enough to contain the working area and small enough to be easily controlled. No eating, drinking, or smoking is allowed in the exclusion zone. The hotline can be as rigid as a fence or simply signs or barrier tape. The main point is to control access into the area. Field personnel will not enter the exclusion zone alone. Entry will be in teams of at least two individuals working under the buddy system. Visitors are not permitted to enter exclusion zones.

4.6.2 Decontamination Zone

The decontamination zone includes the areas immediately surrounding the exclusion zone. This zone has the next highest inhalation hazard, but does not have a high probability of skin contact with cutaneous or percutaneous effecting chemicals. This zone is the area in which the actual decontamination of equipment and PPE takes place. As its name implies, the intent is to reduce contamination, i.e., become progressively cleaner. This means that after decontaminating auxiliary equipment, the most contaminated PPE (e.g., boots, gloves) should be doffed first, the coveralls, other PPE, and finally, the respirator. If the site is heavily contaminated, it may be necessary to have a wash station available for removing surficial contamination before starting the disrobing procedure. Visitors are not permitted to enter decontamination zones.

Personnel decontamination will be completed according to the guidance given in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Personnel and personnel protective equipment will be decontaminated using water or a mixture of detergent and water. Liquid and solid wastes generated during decontamination will be properly collected and disposed. Prior to leaving this zone, workers will be frisked for radioactive contamination.

Every attempt will be made to reduce contamination on equipment and articles to levels that are as low as reasonably practicable. Whenever possible, steam cleaning and the use of detergents and water will be used in place of solvents and chemical decontaminants. Solid and liquid wastes produced during decontamination will be collected for proper disposal.

4.6.3 Support Zone

The support zone (clean zone) covers all areas immediately outside of the decontamination zone. Adverse exposure to chemical is unlikely in this zone. This zone is usually used to store supplies and as a dressing area. Personnel or equipment which have been in the exclusion zone must be decontaminated before re-entering the support zone. Visitors may enter support zones under the following conditions:

- Visitors must be under continuing escort by personnel qualified in at least 24 hours of health and safety training for hazardous waste sites;

- Visitation occurrence is irregular or intermittent and for short-term entry only; and

- Purpose of visitation is observatory in nature or involves the performance of incidental, non-hazardous tasks.

4.7 General Work Practices

- At least one copy of this general HASP and applicable site safety and health plan will be available at each work site.

- Contaminated protective equipment, such as respirators, hoses, boots, etc., will not be removed from the exclusion zone or decontamination zone until it has been cleaned, or properly packaged and labeled.

- Food and beverages will not be permitted or consumed in the restricted-access areas. Possession or use of tobacco products and the application of cosmetics are also prohibited in these areas.

- Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

- During activities all personnel will be required to wash their hands and face before eating, drinking, smoking, or applying cosmetics.

- Portable eyewash stations will be located in the restricted-access areas near work activities.

- All personnel will be required to field wash (hands and face) as a minimum at the end of their shift before leaving the job site if they might have been contaminated. Hands and face will be washed during breaks.

- All personnel will avoid contact with potentially contaminated substances. Walking through puddles or mud and kneeling on the ground should be avoided whenever possible.

- Equipment will not be placed on possibly contaminated surfaces.

- Field personnel must observe each other for signs of toxic exposure and heat/cold illness. Indications of adverse effects include, but are not limited to:

    * Changes in complexion and skin discoloration
    * Changes in coordination
    * Changes in demeanor
    * Excessive salivation and pupillary response
    * Changes in speech pattern

- Field personnel are cautioned to inform each other of non-visual effects of illness such

    * Headaches
    * Dizziness

* Nausea
* Blurred vision
* Cramps
* Irritation of eyes, skin, or respiratory tract

4.8 Training and Information Programs

Training and information programs must comply with requirements specified in OSHA 1910.120(E) and (I). General site workers and the SSHO are required to have satisfactorily completed an off-site 40-hour health and safety training course for conducting work at hazardous waste sites and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. On-site supervisors (e.g., SSHO) responsible for employees performing hazardous waste operations are required to have also completed an 8-hour specialized course on management of such operations. Workers and supervisors must receive 8 hours of refresher training each year. At least one member of each crew will have current certificates in Cardiovascular Pulmonary Resuscitation (CPR) and first aid. Employees expected to respond to hazardous emergency situations shall have been trained in how to respond to expected emergencies.

Prior to beginning the fieldwork tasks, field personnel and subcontractors will be given a training program/briefing by the SSHO and ESH. This session will include, but is not limited to, the following topics:

- Names of SSHO and designated alternates
- Site history and site control measures
- Specific hazards (including toxicological data) and location of materials safety data sheets (MSDS).
- Hazard recognition and symptoms of overexposure
- Standard operation procedures and use of PPE and engineering controls
- Decontamination (personnel and equipment)
- Emergency procedures and locations of emergency equipment
- Respirator fit test and use
- Relevant aspects of the 29 CFR 1910.120(I)(2) site safety and health plan requirements listed at the beginning of this HASP

Throughout the course of the field program, field management personnel and the SSHO will be responsible for ensuring the implementation of and adherence to the health and safety program. In addition, the following items will be discussed during briefings between the project representative and personnel on-site. It should be kept in mind that these points are not exclusive, and any other potentially hazardous situation that may be known by the parties involved in this safety briefing should be outlined at the time of the meeting.

- Hazardous substances (suspected or known contaminated media that personnel may be exposed to)

- Hazard assessment (toxic effects, reactivity, warning signs)

- Levels of personal protection to be employed in work areas

- Work area monitoring and the atmospheric concentrations which warrant changes in the level of respiratory protection

- Personnel exposure emergency procedure (skin contact, inhalation, ingestion, falls, etc.): Notify ESH (or shift superintendent at ext. 3025)

- Potential or actual fire or explosion emergency procedure: Call emergency #5555. Relate location and status of the fire or explosion and injuries to personnel. Response will be immediate

- Potential or actual ionizing radiation exposure emergency procedure: Notify Energy Systems ESH of suspected or actual exposure to ionizing radiation (e.g., ingestion of uranium particulates). ESH will respond by notifying either the shift superintendent or health physics personnel as the situation warrants

- Environmental accidents emergency procedure (spread of contamination outside existing site): Call shift superintendent at ext.3025 and relate incident. The shift superintendent or his representative will be the authority at the site of the incident

- Emergency signals and/or codes: (See Part 4.11.2 of this section for a description of emergency alarms)

- Emergency routes: (This will depend upon worksite location)

Emergency phone number: 5555

4.9 Medical Surveillance

As a minimum, the medical monitoring program will satisfy the requirements of 29 CFR 1910 including, but not necessarily limited to, those provided in 29 CFR 1920.120 (the hazardous waste operations standard) and 29 CFR 1910.134 (the respiratory protection standard).

All participating personnel must have a copy of a written opinion from the examining physician dated not more than 12 months prior to on-site operations. This opinion includes the following:

- The results of the medical examination and tests;

- The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response;

- The physician's recommended limitations upon the employees assigned work with special emphasis on fitness for duty, including the ability to wear any required personal protective clothing and equipment under conditions (i.e., temperature extremes) that may be expected

at the work site; and

A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

4.10 Hazardous Waste Site Emergency Procedures

The SSHO shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed. The following standard emergency procedures will be used by on-site personnel.

4.10.1 Injury in Exclusion or Decontamination Zone

In the event of an injury in the exclusion zone, all site personnel shall exit the exclusion zone and assemble at the decontamination line. The on-site inspector will evaluate the nature of the injury and the affected person should be decontaminated to the extent practical prior to movement to the support zone. Appropriate first aid will be initiated, and an immediate request will be made for an ambulance (if necessary) and the designated medical facility notified (if required). No persons will re-enter the exclusion zone until the cause of injury or symptoms is determined.

4.10.2 Injury in the Support Zone

In the event an injury occurs in the support zone, the SSHO must be notified immediately. Appropriate first aid will be administered and, if necessary, the injured individual will be transported to the designated medical facility. If the injury does not affect the performance of site personnel, operations may continue.

4.10.3 Fire/Explosion

In the event of a fire or explosion at the site, the PORTS fire department will be alerted and all personnel should move to a safe distance from the area (See Section 4.11 for a list of emergency phone numbers).

4.10.4 Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and designated buddy will immediately leave the exclusion zone. Re-entry to the exclusion zone will not be permitted until functionally sound equipment has been donned.

4.11 PORTS Emergency Procedures

Emergency phone numbers and directions to the nearest medical facility will be posted at conspicuous places in the support zone. The policy at PORTS is to maintain an emergency preparedness program to provide the maximum practical protection for employees, DOE and DOE contractor personnel, members of the public, and property in the event of emergencies involving

activities on the PORTS site. Because of the nature of the facility, visitors to PORTS are always accompanied by an escort. The escort will be familiar with emergency situation response, the locations of monitoring stations, etc., and can direct visitors should an emergency situation occur. The following information is provided in case of alarms or emergencies.

4.11.1 Reporting an Emergency

Any person discovering an emergency condition at a RCRA facility should immediately alert the Plant Emergency Director (PED) and the Plant Emergency Response Team by one of the following means:

- Dial 5555 on any phone. Give your name and all vital information to the answering parties. The plan emergency squad will respond;

- Actuate a red fire alarm box - if possible wait nearby to provide the emergency squad with details of the emergency;

- Use the plant radio system to notify X-300 (plant control facility); and

- Pick up a red emergency phone. X-300 will answer. Give your name and details of the emergency.

After alerting the plant emergency director and the plant emergency response team, the person discovering the emergency should do whatever can safely be done to minimize the emergency.

In all emergencies, no matter how the alarm is initiated, it is important that the PORTS cascade coordinator is on the receiving end of an initial request for the emergency response team. The only way the coordination personnel would not be included in the initial alert sent in by one of the means above would be because of a malfunction of their equipment. Any time an alarm is received by the police or fire department and cascade coordination does not respond with immediate contact of police and fire departments, it will be assumed that cascade coordination did not receive the alarm and it will be the responsibility of the fire department captain or the police console operator to pick up the red emergency phone and include the cascade coordinator in the initial alert.

4.11.2 Recognizing Emergency Alarms

The steady sounding of sirens atop the X-330 and X-326 building is an alert signal listen for a public address announcement.

- The wailing, or intermittent sounding of these sirens is a signal to take cover or protective action. It means an attack against our country has been detected.

- Building horns - a continuous blast means leave the building immediately and go to a monitoring station or assigned assembly point.

- Gas release sirens are local alarms. They are located at X-330 Tails and Side Feed Facilities, X-326 ERP and PW Sampling Areas, X-700 Furnace Stand, X-342, X-344, and the HF

Storage unit Farm. When you hear a continuous modulated high-frequency siren at one of these facilities, evacuate the area and seek a position upwind.

- Any signal consisting of a series of seven short tones, sounded three times, is a request for personnel accountability. Report in person or by phone to your home base as soon as possible.

- A radiation alarm is a continuous sounding of building horns and the local radiation cluster nitrogen horns. Flashing red lights outside will be on. Immediately leave the affected building and go to a monitoring station.

4.11.3 Monitoring Station Locations

- Trailer southeast of X-100
- Fire station (X-106)
- Frame building east of X-105
- Maintenance shop in X-533 switchyard
- Inside X-630 pumphouse, north end
- Cement building south of X-530 switchyard

Additional monitoring stations will be established as needed near investigated units. Any such proposed stations will be identified in the appropriate site safety and health plan.

4.12 Records and Reporting Requirements

The contractor will notify the DOE site office, PORTS safety department, the project manager, and the responsible field manager of a fatality or serious accident, as required in DOE Order 5484.1A. Fatal accidents will be investigated by the PORTS safety department and/or DOE representatives as the situation requires.

The contractor will be responsible for the recording and reporting of illnesses and injuries in accordance with PORTS and OSHA requirements. Copies of these reports will be provided to the contractor's project files and the Portsmouth facility's safety department personnel. Recordable occupational accidents and illnesses are those defined in DOE Order 5484.1A, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements" and OSHA 29 CFR 1910 and 1926.

The contractor will submit a DOE form 5484.X "Individual Accident/Incident Report" for each occurrence for which reporting is required under DOE 5484.1A. Forms will be submitted to the Portsmouth facility's safety department and the cognizant DOE operations office. Additionally, the contractor should comply with all reporting requirements as identified in OSHA 29 CFR 1910 and 1926.

The contractor will maintain records of employee's exposures to radioactive or toxic materials or other harmful physical agents for a period of 30 years. In addition, a copy of all radiation exposures records will be transferred to the Portsmouth facility's health physics department upon employee

termination or completion of the contract. Reporting requirements of DOE Order 5484.1 will be adhered to by the contractor and Portsmouth facility.

All site workers are required by DOE Order 50003 to notify the PORTS Safety Department and cognizant DOE Site Office of any unusual occurrences. An "unusual occurrence" is any unusual or unplanned event having programmatic significance such that the event adversely affects or potentially affects the integrity of the site, the performance and reliability, or safety of the project. Notification of occurrences similar to the following will be required:

- Any substantial degradation of a barrier designed to contain radioactive or toxic material or any substantial release of radioactive or toxic material past this barrier (e.g., overflow of a water treatment pond, contaminant release into a stream, or contamination released beyond the site boundary);

- Accidents involving the transport of radioactive, hazardous, or toxic materials;

- Any fire or explosion which affects the integrity of the site or project;

- Any condition, resulting from natural events or manmade activities, which substantially affects or threatens performance, reliability, or safe operation (e.g., site flooding, wind damage, soil stability problems, personnel operation errors which create hazardous conditions);

- Any radiation or chemical exposure in excess of applicable limits;

- Any incidence or breach of access control by unauthorized personnel;

- Any acts of vandalism or major theft occurring at a site; and

- Any release of contamination outside the controlled area; including personnel, equipment, and roadways.

The contractor will maintain a central file of all enforcement inspections and reports along with violations and abatement actions that will be available for inspection by either the PORTS safety department or DOE's personnel. The contractor will also maintain a central file of formal employee health and safety complaints and reports of their disposition. Upon request, these will be made available for inspection by affected employees or their authorized representative.

The contractor will maintain documentation of all employee training, including the OSHA required 40 hours training, site specific training, new employee orientation, refresher courses, respirator fit test results, and respirator training in addition to other requirements specified by OSHA.

4.13 Complaints

A DOE Form 5480.2 (12/86) poster shall be posted at hazardous waste operation sites. Employees are encouraged to report to the SSHO either directly or through their authorized employee

representative any conditions or practices which they consider detrimental to their health or safety or which they believe are in violation of applicable health and safety standards. Such complaints may be made orally or in writing. The contractor will also have available in the workplace DOE Form F-5480.4, "Occupational Safety and Health Complaint Form," to be used in reporting violations.

Employees who believe that an imminent danger exists that threatens human or environmental health, death or serious physical harm, are encouraged to bring this matter to the immediate attention of the SSHO for resolution. In the event of the inadequate corrective action, the employee and/or authorized representative may also contact the local agency having jurisdiction, the contractor's project office, or ESH by telephone and set forth with reasonable particularity the basis for their request for an immediate inspection. Competent medical personnel, which may include a physician, will evaluate the symptoms of illnesses that could seriously affect a worker's health and safety.

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Table 1
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

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UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)

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UNIT NUMBER	UNIT TITLE
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT

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UNIT NUMBER	UNIT TITLE
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY

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UNIT NUMBER	UNIT TITLE
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING

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UNIT NUMBER	UNIT TITLE
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

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Table 2
X-326 Containment Capacity Calculations

Area Designation	1	2	3	4	5	West L	East L
Total square feet	968	3082	1400	3082	2552	11,876	8928
Available square feet	950	3058	1388	3058	2528	11,812	8644

Maximum gallons: 133,540
Total square feet: 31,888

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Table 3
Maximum Number of Containers, X-326 Unit

Container Volume	Maximum Number
85 gallon	1,570
55 gallon	2,400
30 gallon	2,450
20 gallon	2,450
5 gallon	2,450
2.47 gallon (polybottle)	3,000
1.7 gallon	3,000

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Table 4
X-326 Sampling Parameter List

Inorganics	**Organics**
arsenic	chloromethane
barium	bromomethane
cadmium	vinyl chloride
chromium	chloroethane
lead	methylene chloride
mercury	acetone
selenium	carbon disulfide
silver	1,1-dichloroethane
	1,1-dichloroethene
cyanide	1,2-dichloroethene (total)
	chloroform
	1,2-dichloroethane
	2-butanone
	1,1,1-trichloroethane
	carbon tetrachloride
	vinyl acetate
	bromodichloromethane
	1,2-dichloropropane
	cis-1,3-dichloropropene
	trichloroethene
	dibromochloromethane
	1,1,2-trichloroethane
	benzene
	trans-1,3-dichloropropene
	bromoform
	Freon 113
	4-methyl-2-pentanone
	2-hexanone
	tetrachloroethene
	toluene
	1,1,2,2-tetrachloroethane
	chlorobenzene
	ethyl benzene
	styrene
	xylenes (total)

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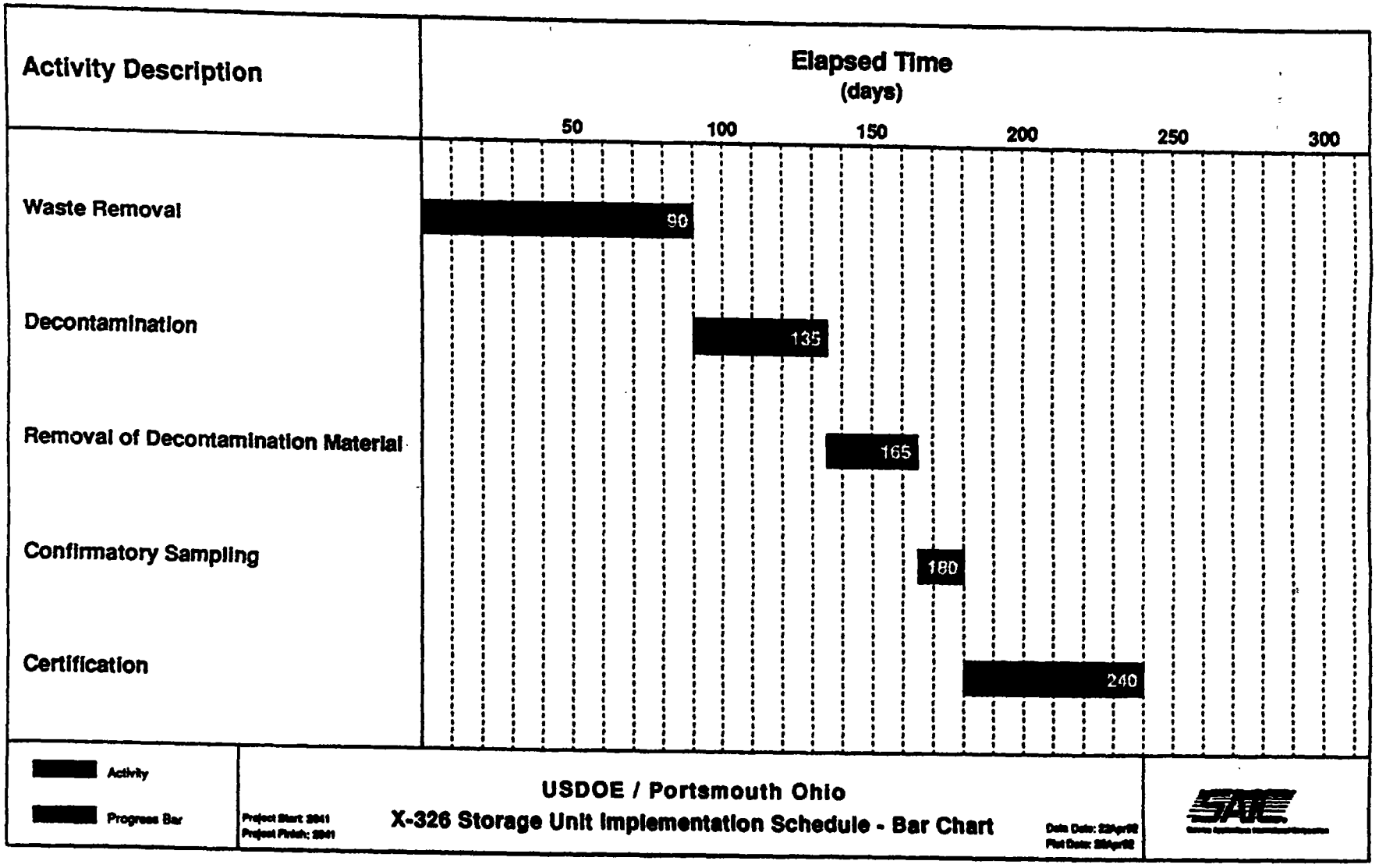

Table 5. Implementation Schedule for Closure of the X-326 Storage Unit

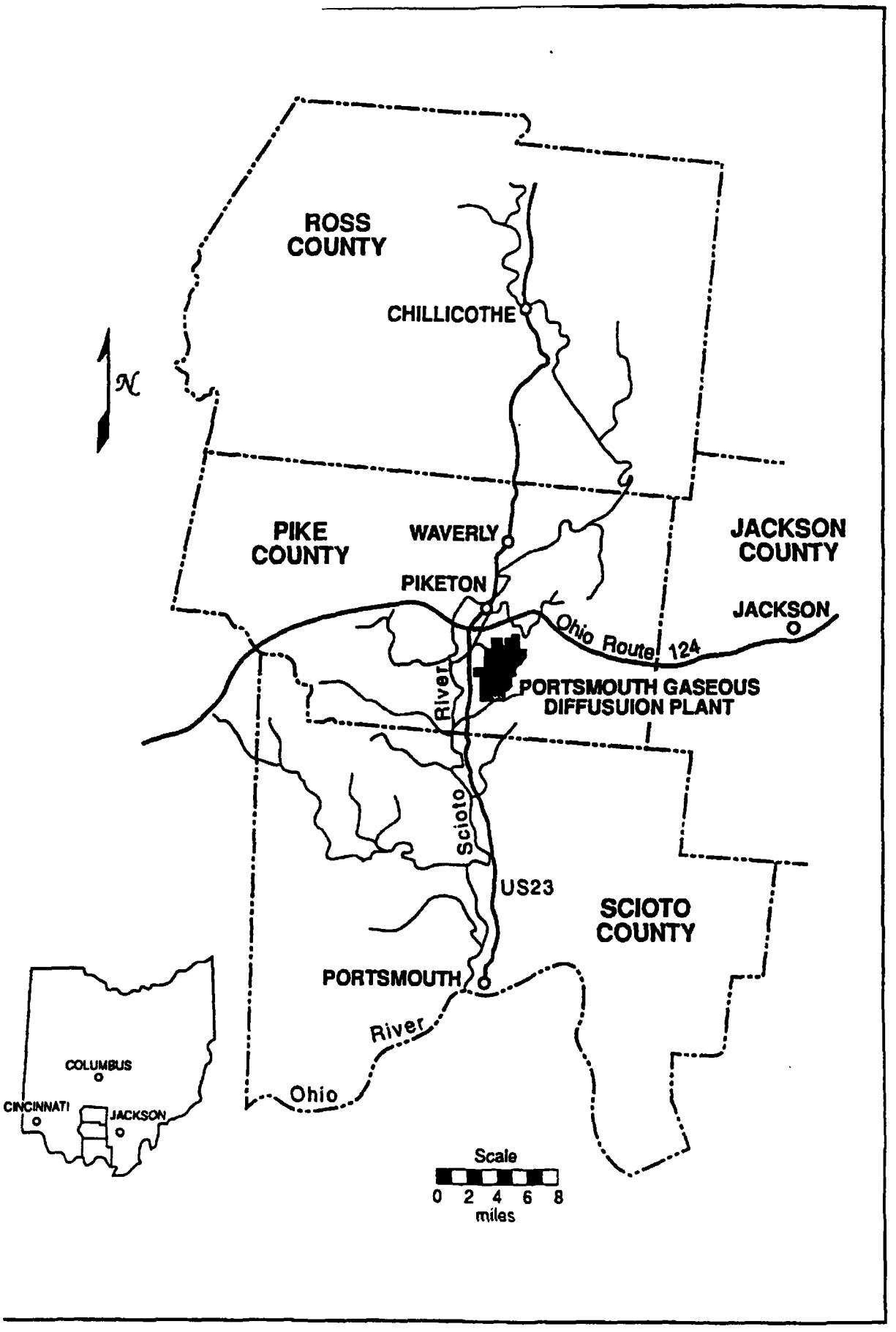

Figure 1. Location of the Portsmouth Gaseous Diffusion Plant

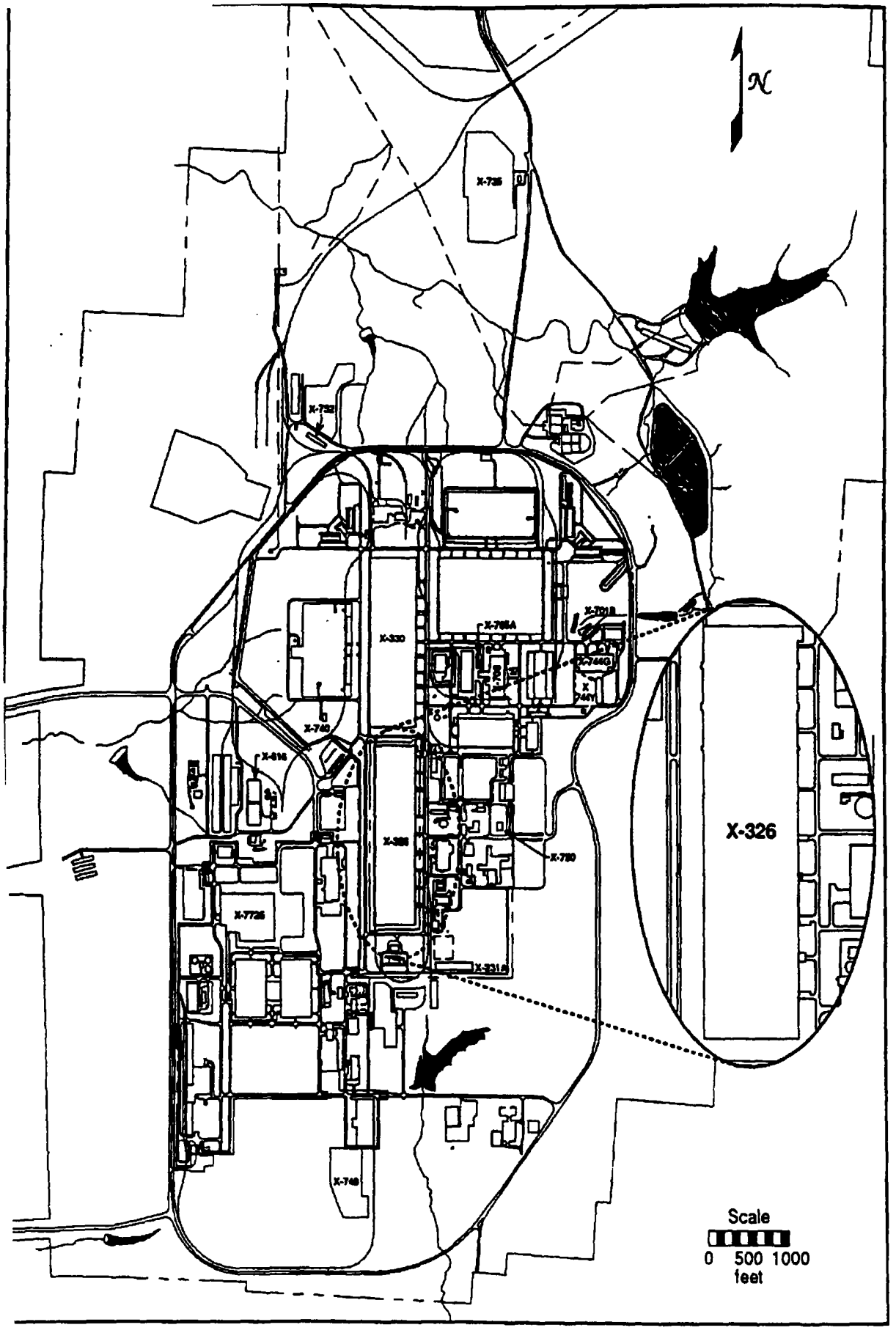

Figure 2. Location of X-326 at the Portsmouth Gaseous Diffusion Plant

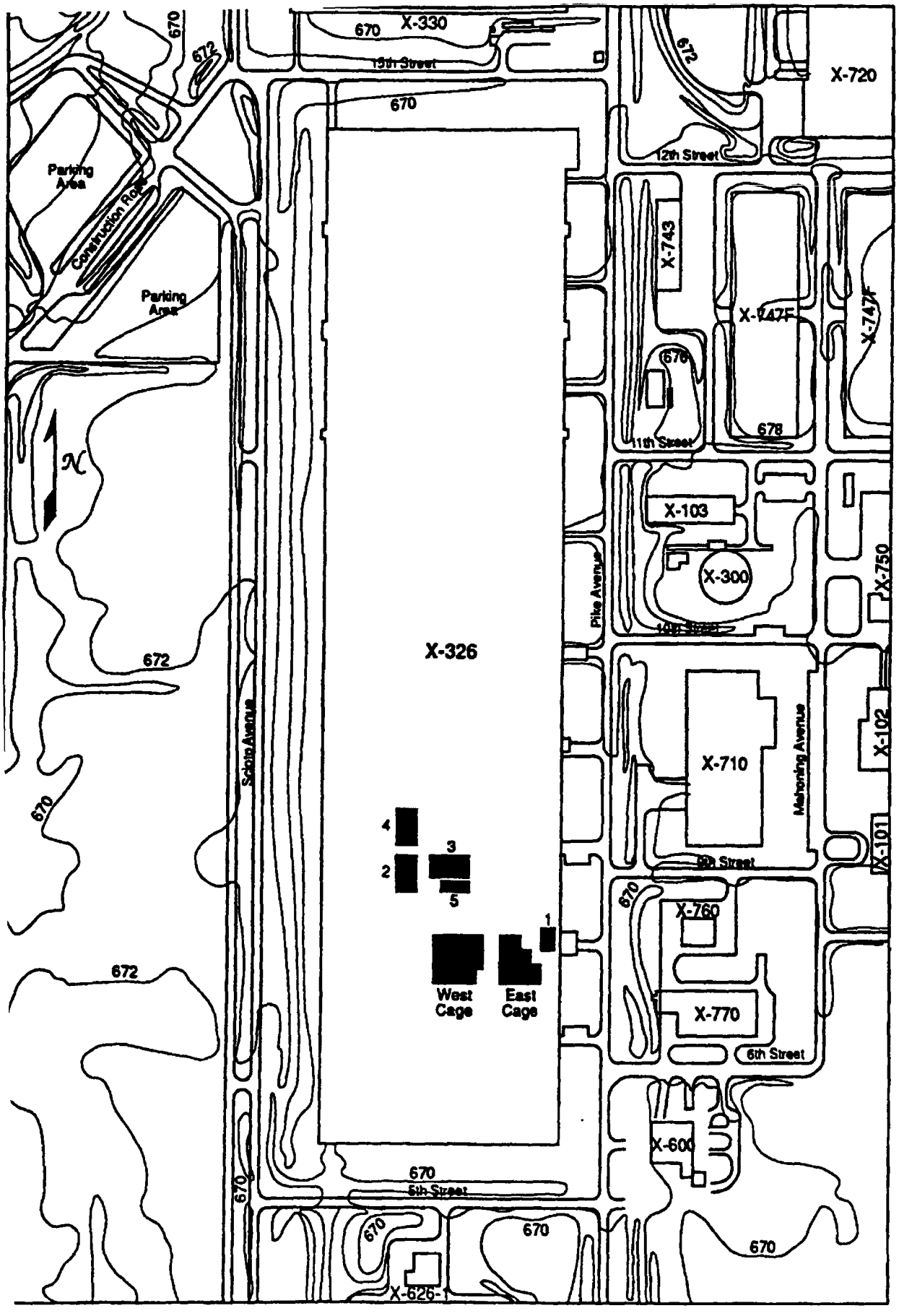

Figure 3. Topographic Details of the X-326 Facility

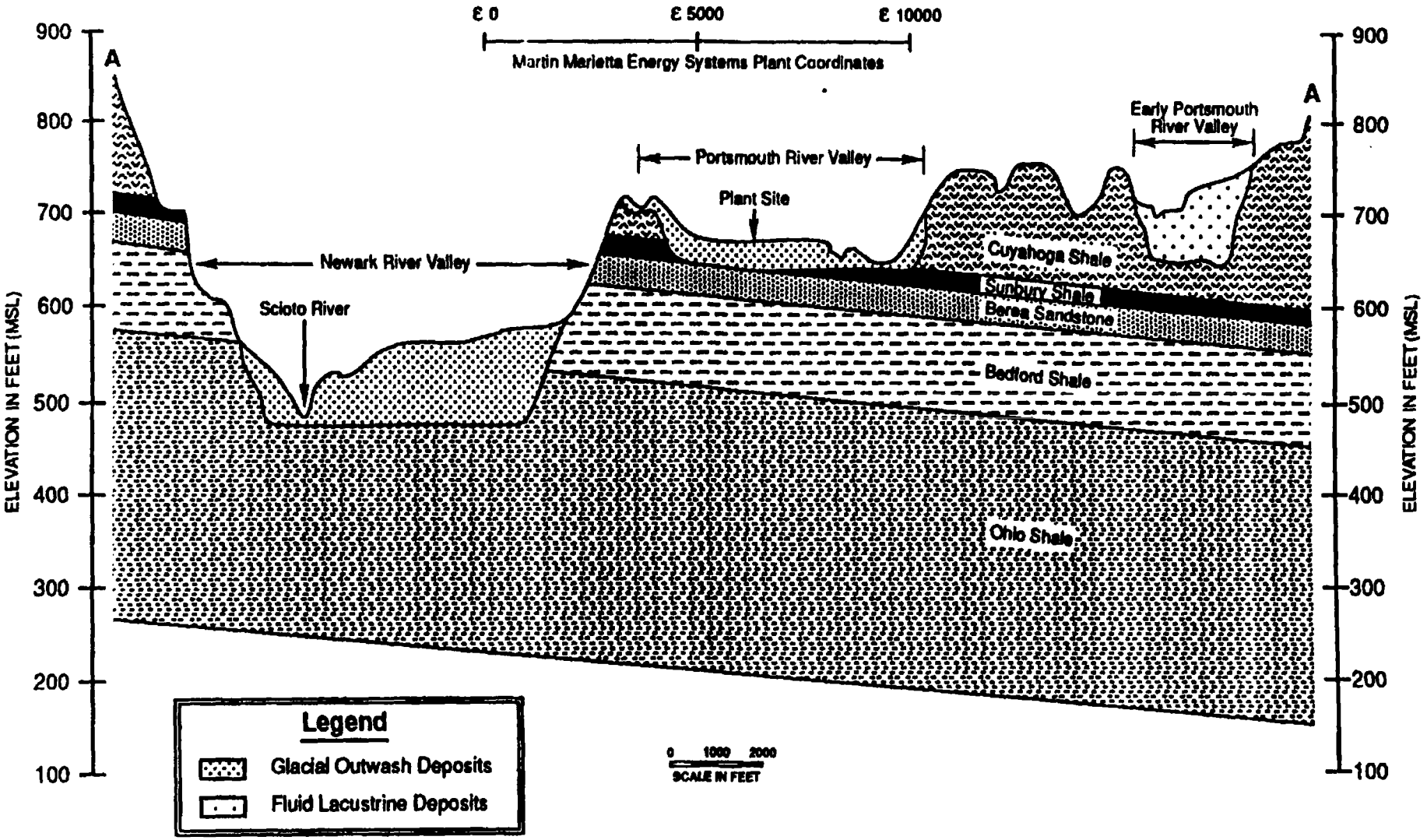

Figure 4. Regional Structural Cross Section through PORTS

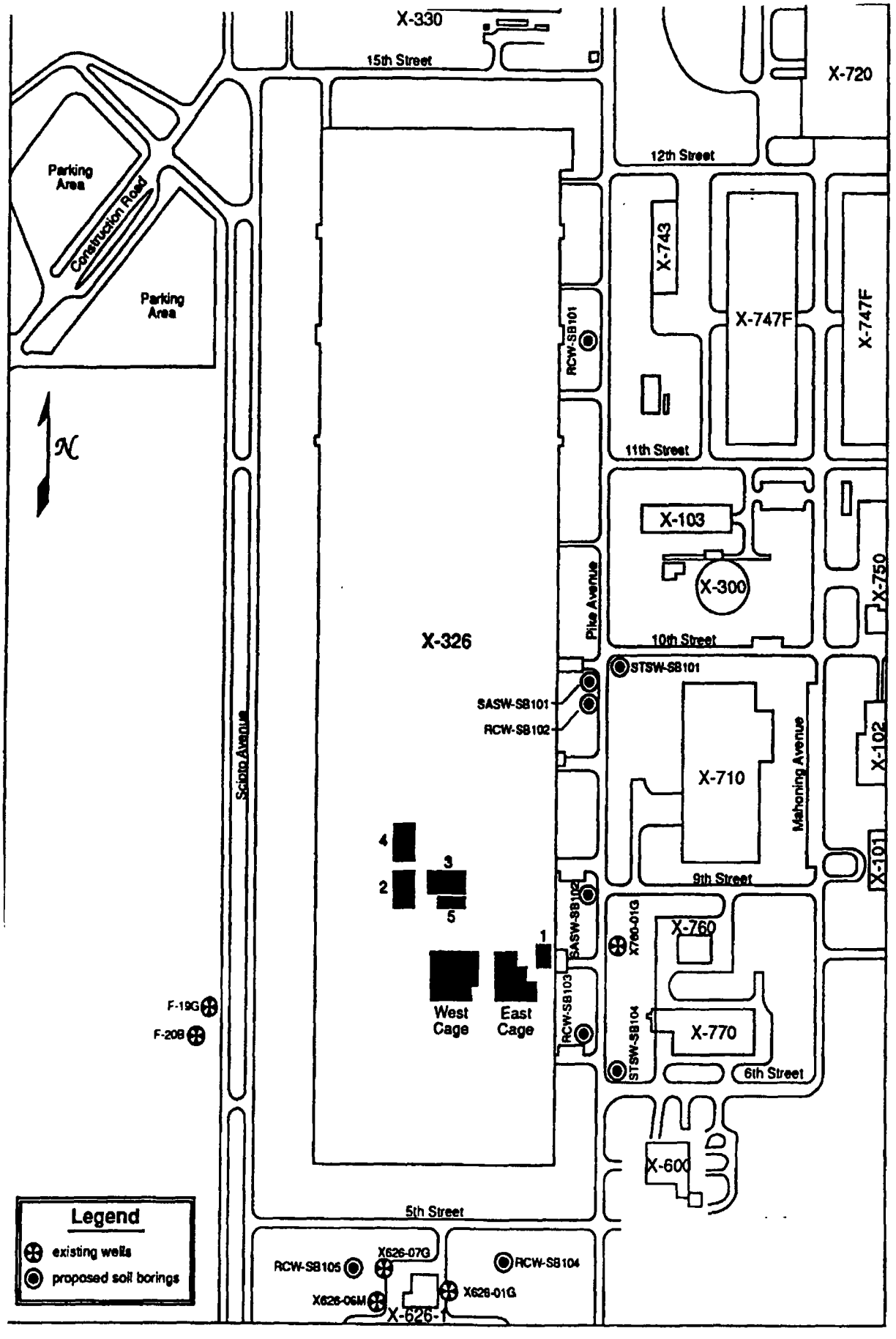

Figure 5. Existing and Proposed Wells and Soil Borings Near X-326

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APPENDIX A

Quadrant III RFI Description of Current Conditions
Title Page and Table of Contents

SUBMISSION DATE: February 21, 2000

QUADRANT III

DESCRIPTION OF CURRENT CONDITIONS

For the

PORTSMOUTH GASEOUS DIFFUSION PLANT

PIKETON, OHIO

Operated by

MARTIN MARIETTA ENERGY SYSTEMS

For

UNITED STATES DOE

UNDER CONTRACT # DE-AC05-760R00001

Prepared By

GERAGHTY & MILLER, INC.
ENVIRONMENTAL SERVICES

6209 Riverside Dr., Suite One South
Dublin; OH 43017

May 1990

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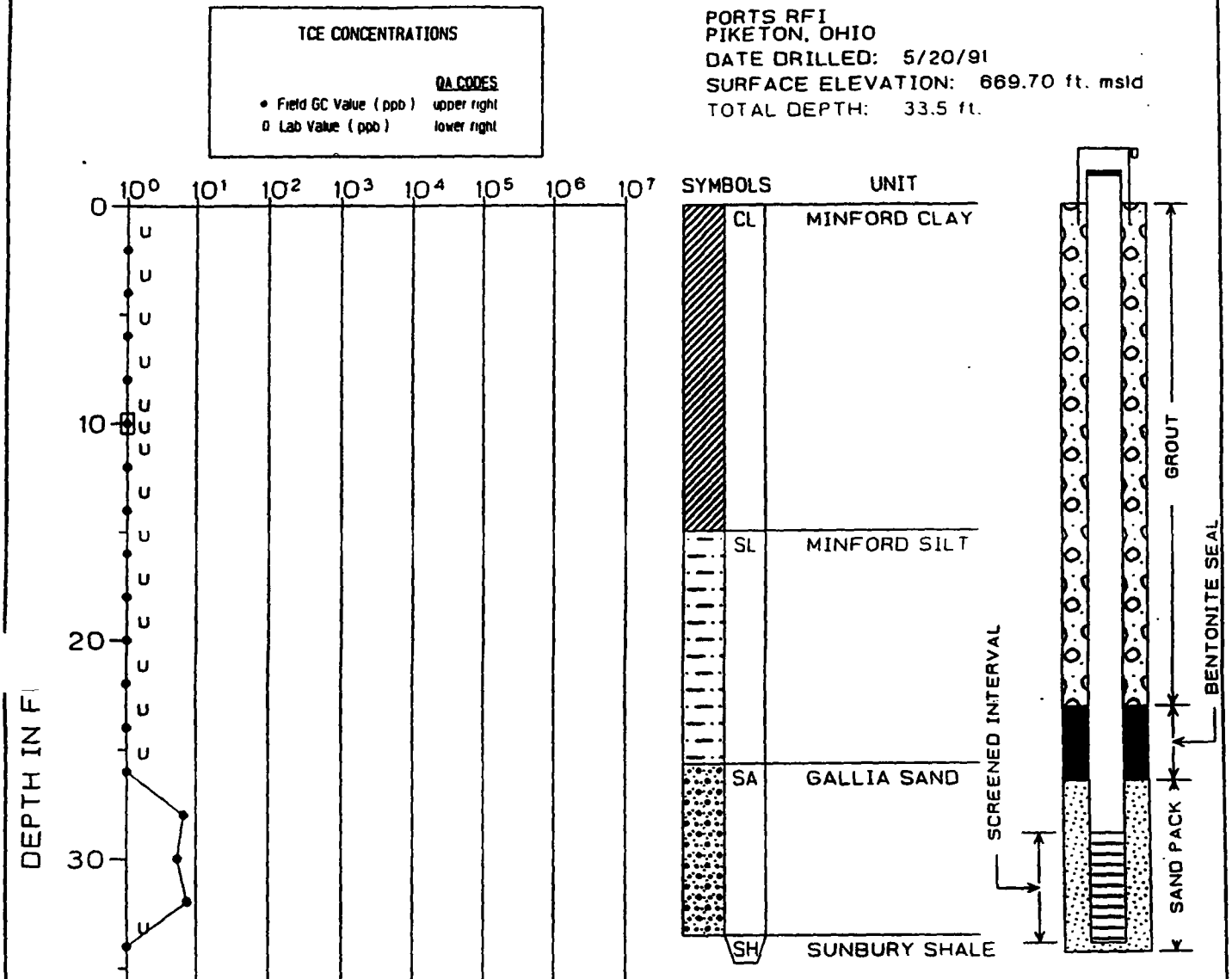
APPENDIX B

Stratigraphic and Construction Logs of Wells and Soil Borings in the Vicinity of the X-326 Storage Unit

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. X760-01G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/20/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 33.5 ft.



NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

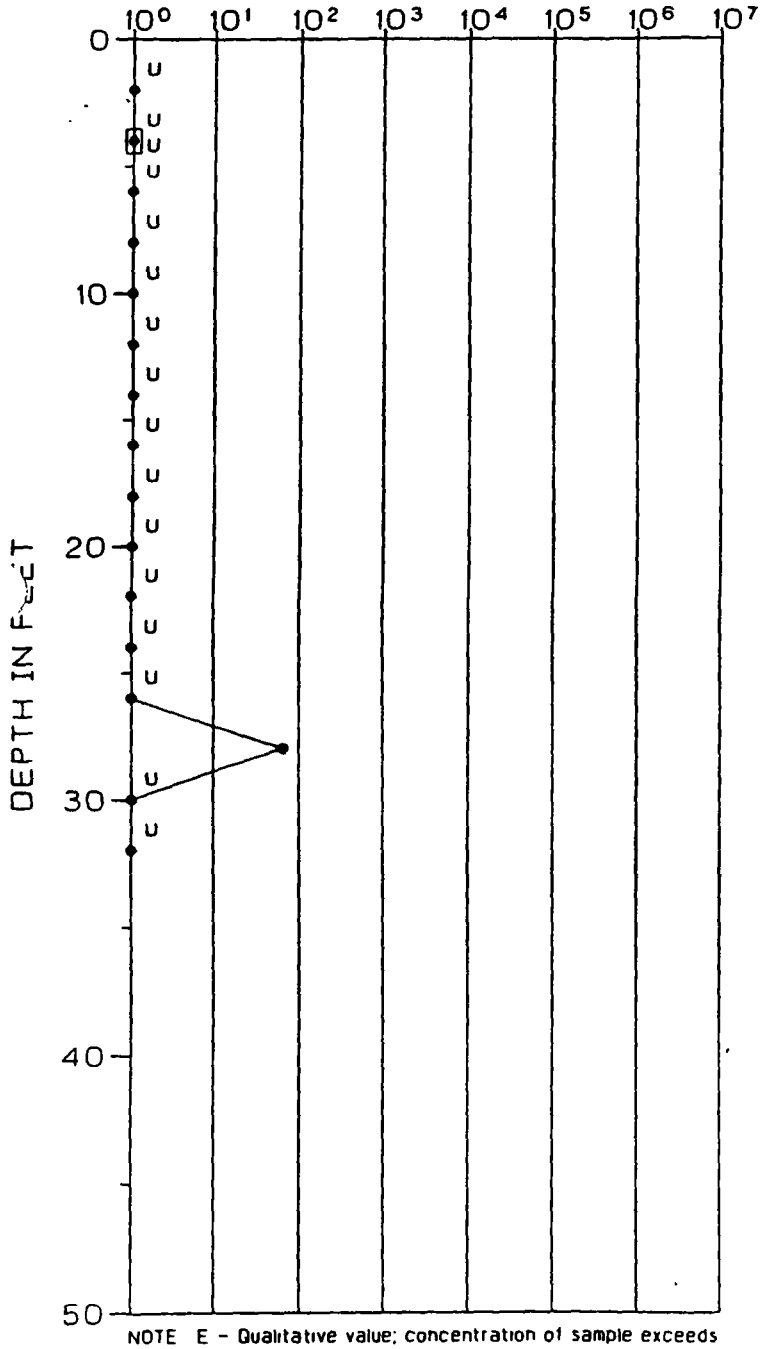
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

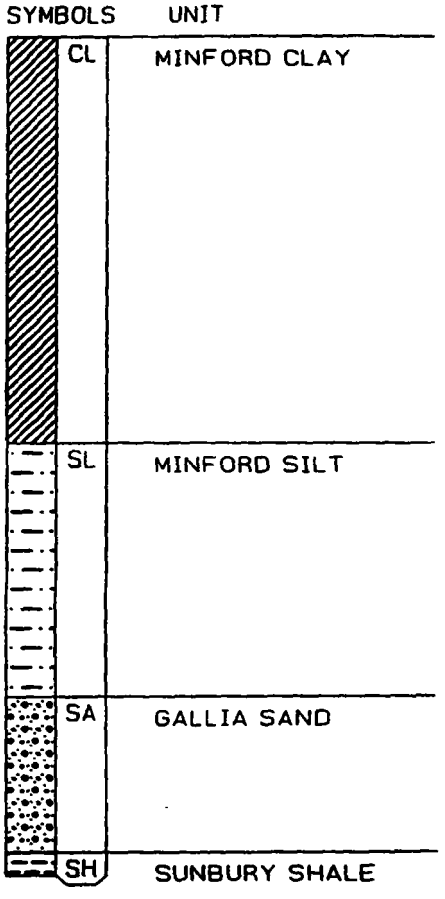
BORING NO. SASW-SB102

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/7/91
SURFACE ELEVATION: 670.90 ft. msld
TOTAL DEPTH: 33.0 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
□ Lab Value (ppb)	lower right





TD = 33.0 ft.

NOTE E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph

J - Qualitative value; not all quality control criteria met

M - Qualitative value; matrix problems encountered

U - Analyte not detected

Q - Questionable peak

* - Unknown peaks

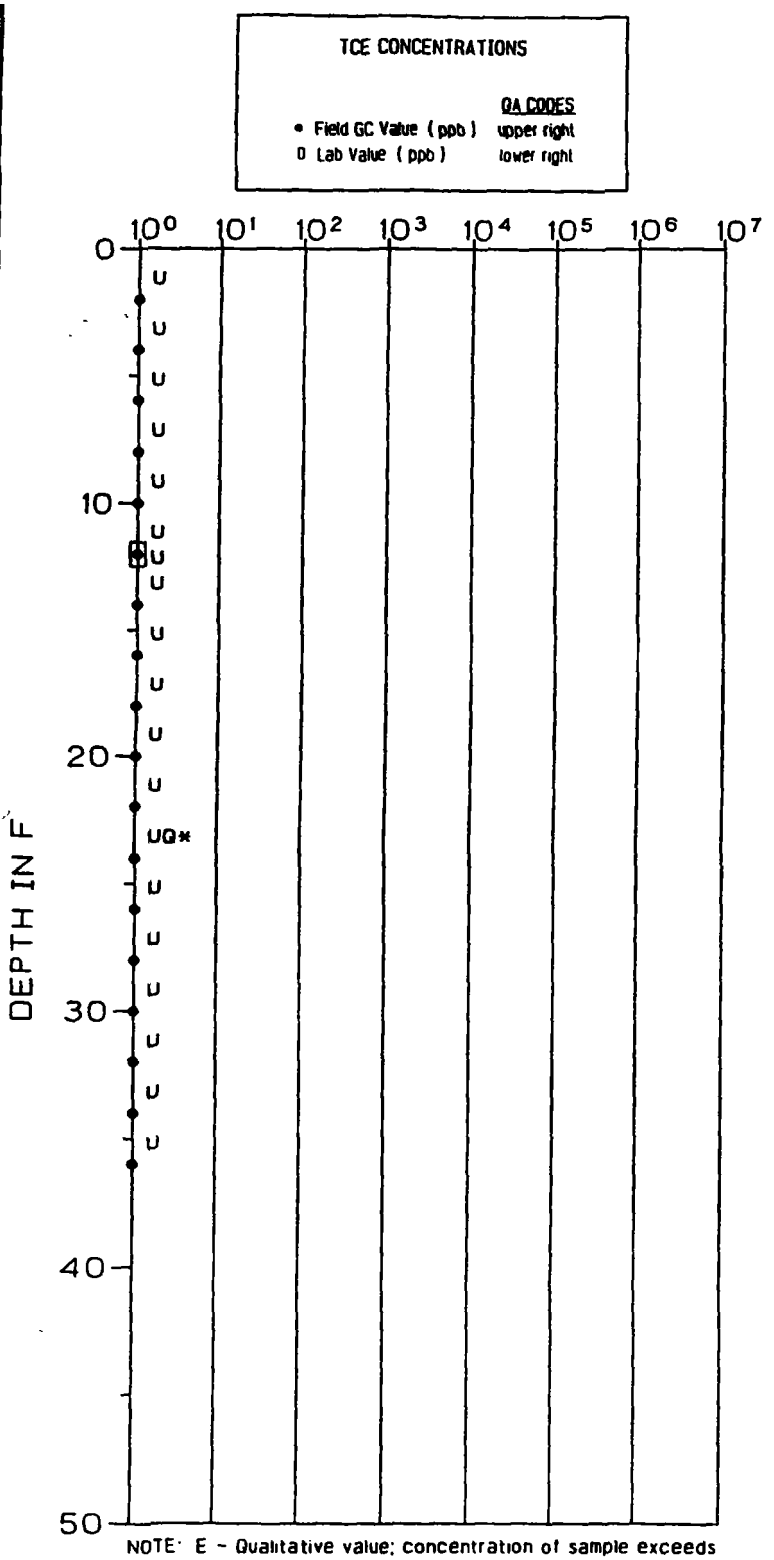
BORING LOG

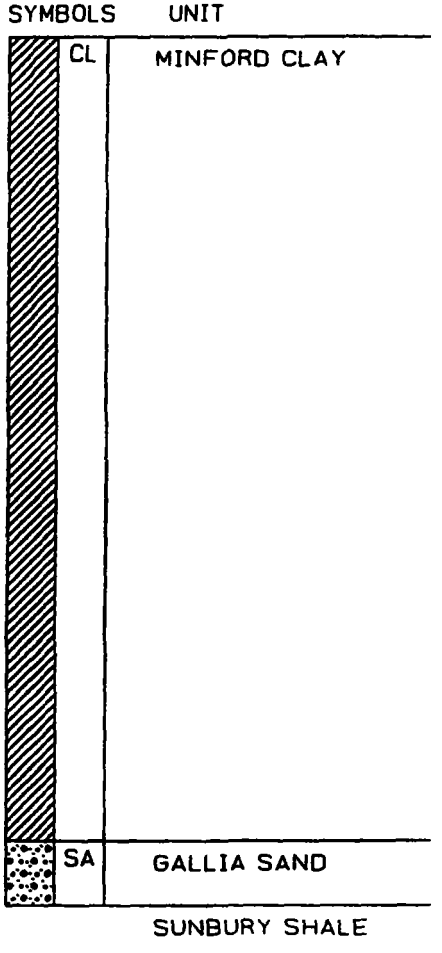
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB101

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/8/91
SURFACE ELEVATION: 672.20 ft. msld
TOTAL DEPTH: 34.1 ft.





NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered.
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

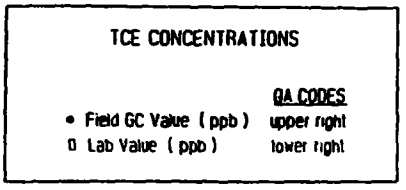
BORING LOG

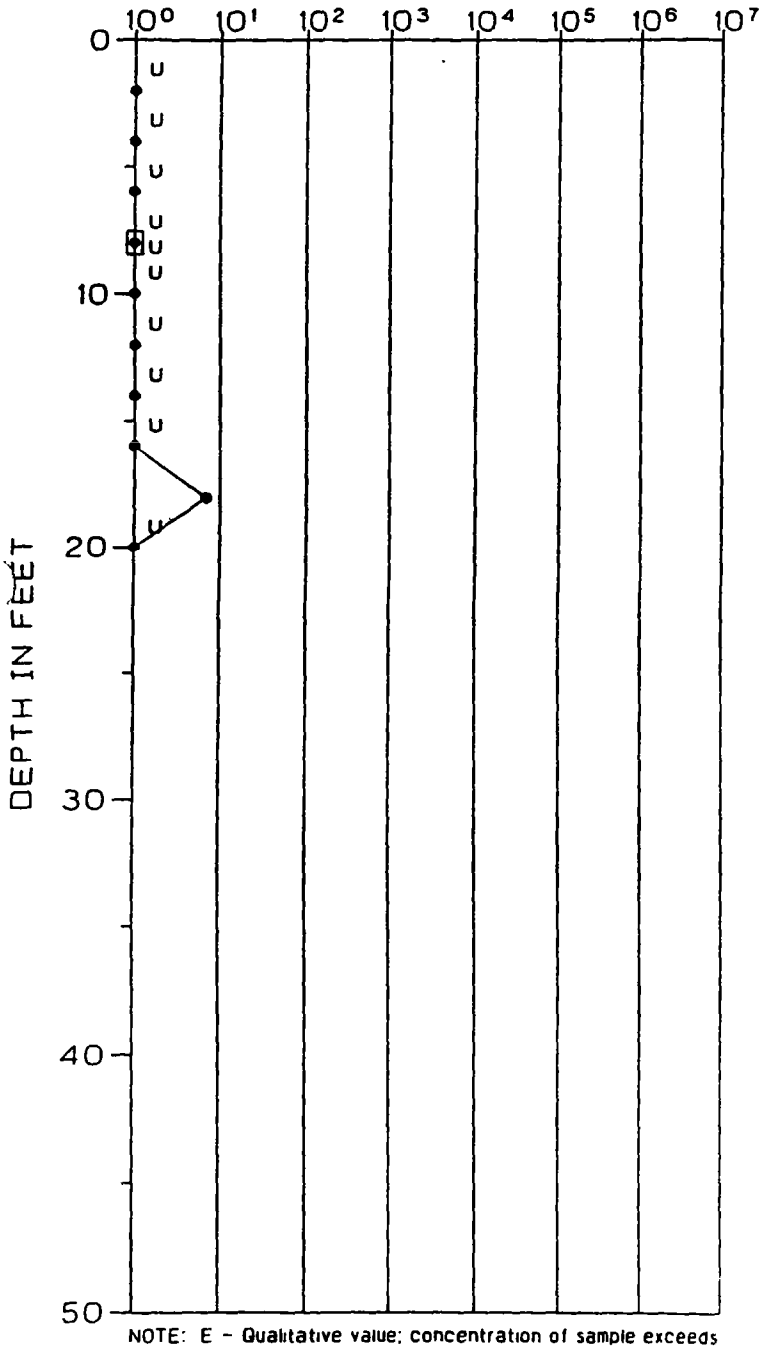
Geraghty & Miller Inc.
Environmental Services

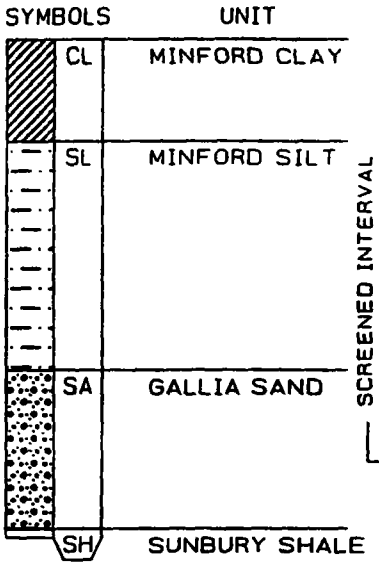
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

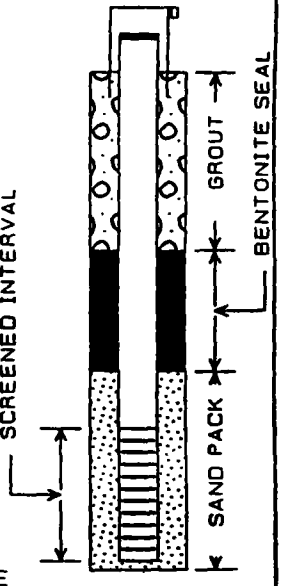
BORING NO. STSW-101G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 6/27/91
SURFACE ELEVATION: 657.70 ft. msld
TOTAL DEPTH: 19.6 ft.









TD = 19.6 ft.

NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value; not all quality control criteria met
M – Qualitative value; matrix problems encountered
U – Analyte not detected
Q – Questionable peak
* – Unknown peaks

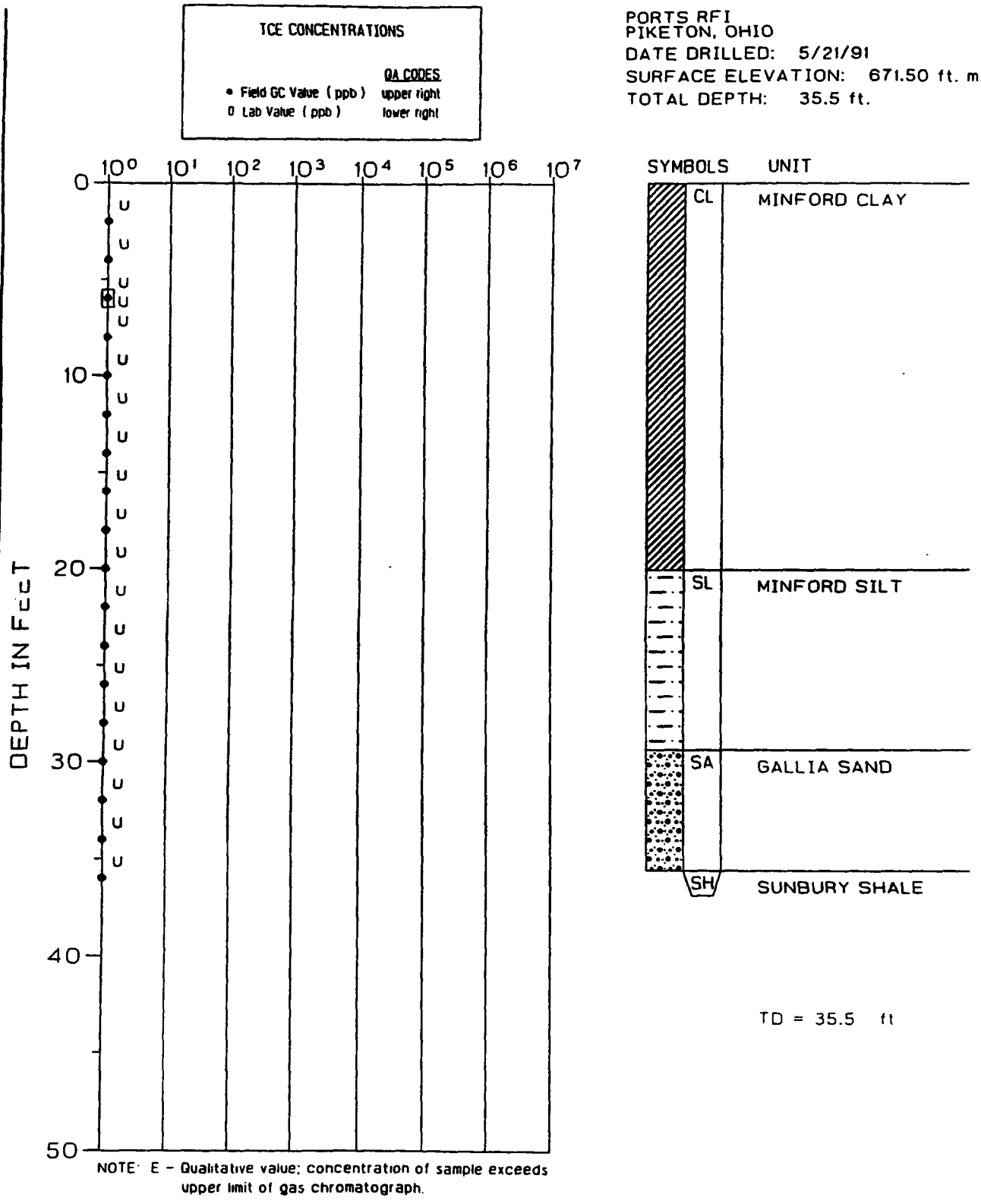
WELL LOG

Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. SASW-SB101

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/21/91
SURFACE ELEVATION: 671.50 ft. msld
TOTAL DEPTH: 35.5 ft.



NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.

J – Qualitative value; not all quality control criteria met.

M – Qualitative value; matrix problems encountered

U – Analyte not detected.

Q – Questionable peak

* – Unknown peaks

BORING LOG

Geraghty & Miller Inc.
Environmental Services

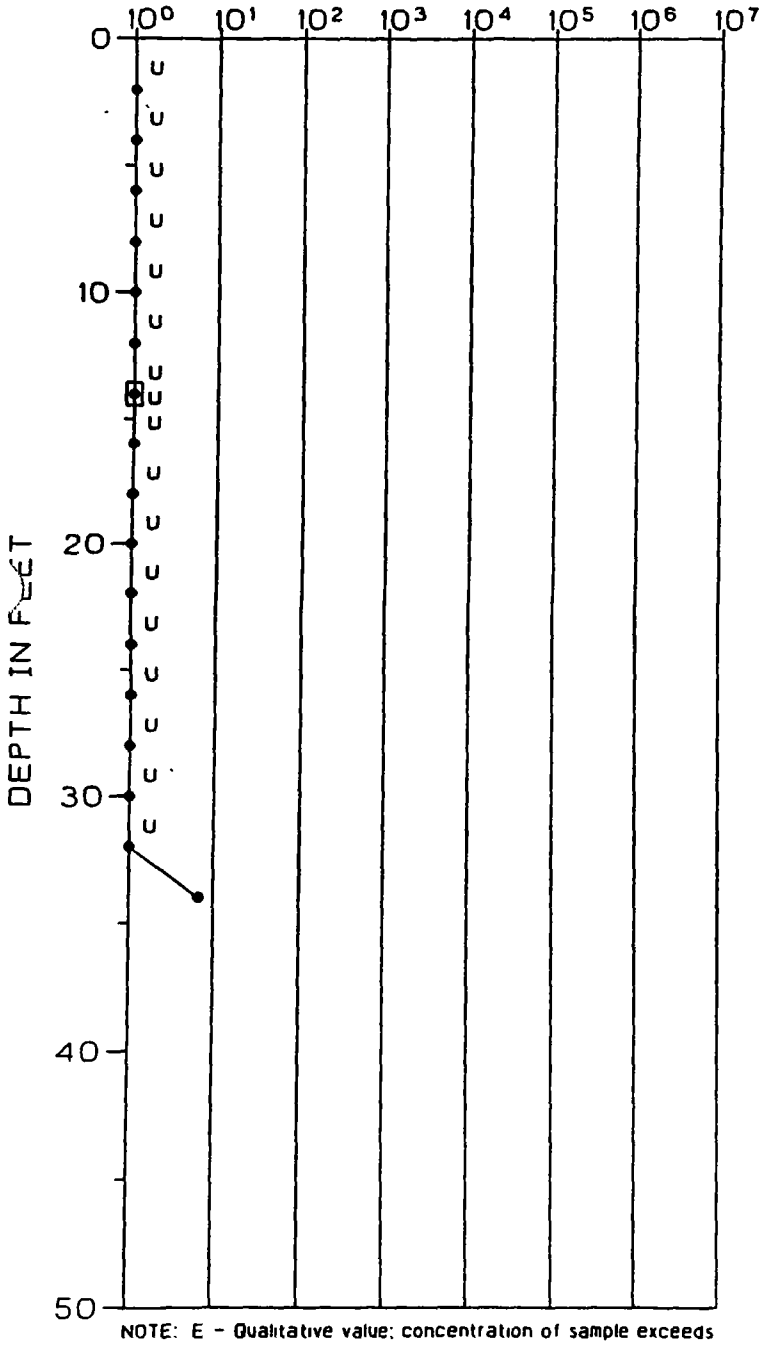
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

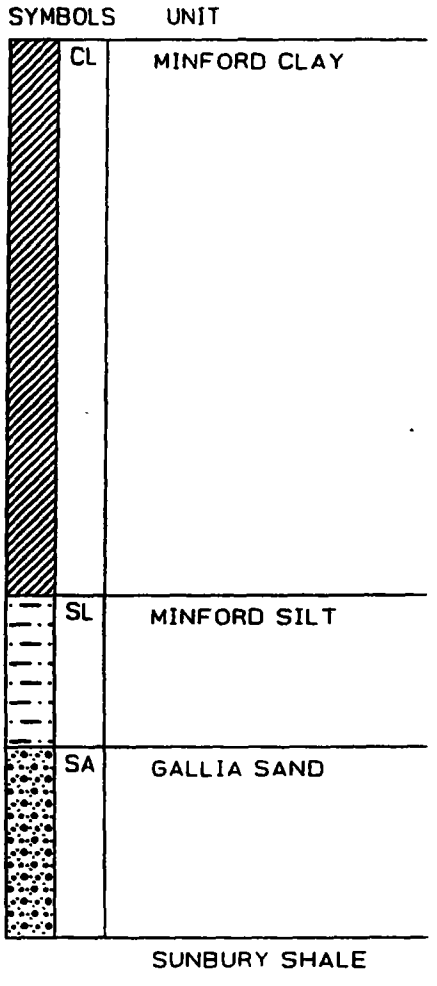
BORING NO. RCW-SB102

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/23/91
SURFACE ELEVATION: 670.70 ft. msld
TOTAL DEPTH: 35.5 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
0 Lab Value (ppb)	lower right





TD = 35.5 ft.

NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph
J – Qualitative value; not all quality control criteria met
M – Qualitative value; matrix problems encountered.
U – Analyte not detected
Q – Questionable peak
* – Unknown peaks

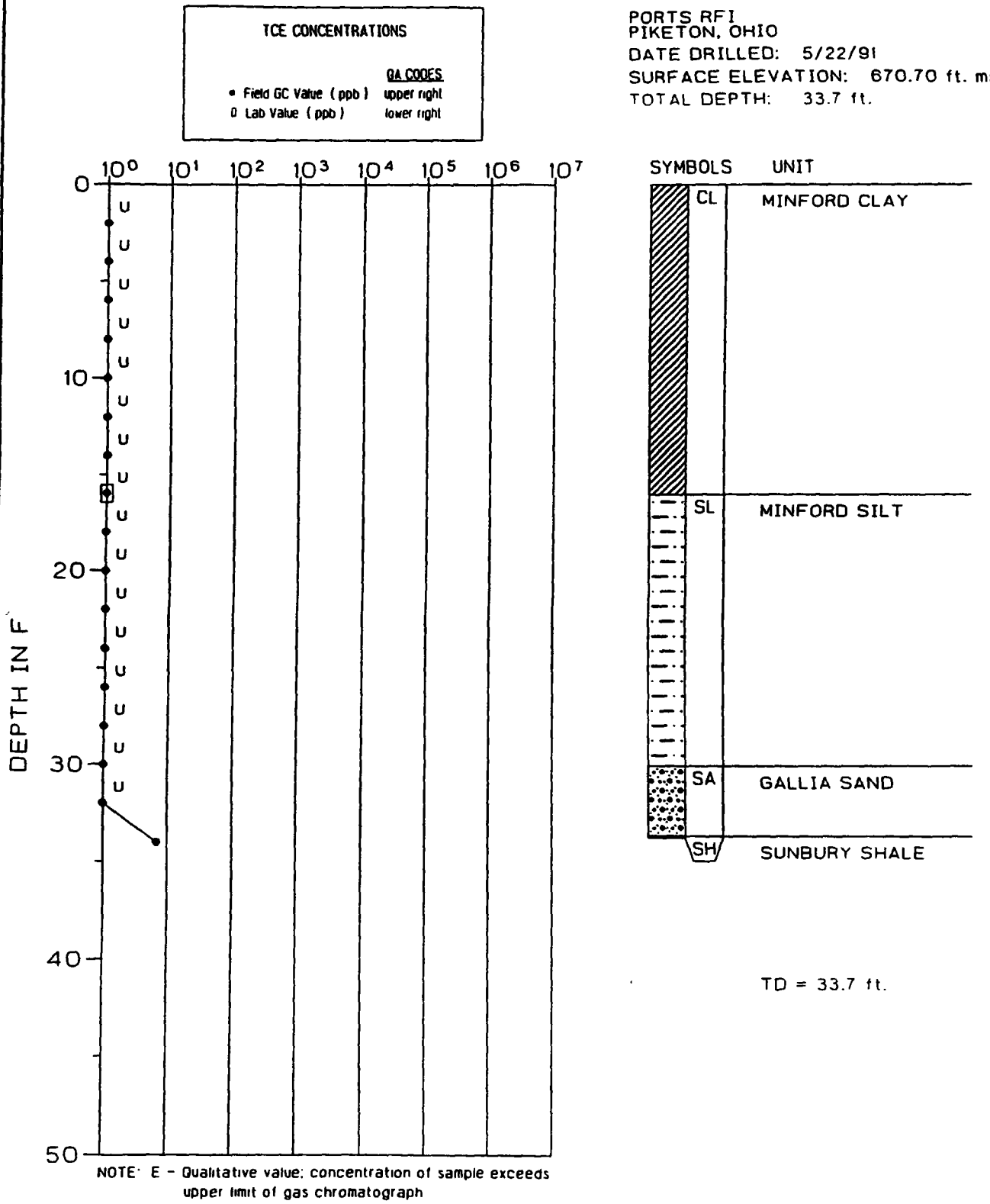
BORING LOG

Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB103

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/22/91
SURFACE ELEVATION: 670.70 ft. msld
TOTAL DEPTH: 33.7 ft.



NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph

J - Qualitative value; not all quality control criteria met

M - Qualitative value; matrix problems encountered

U - Analyte not detected

Q - Questionable peak

* - Unknown peaks

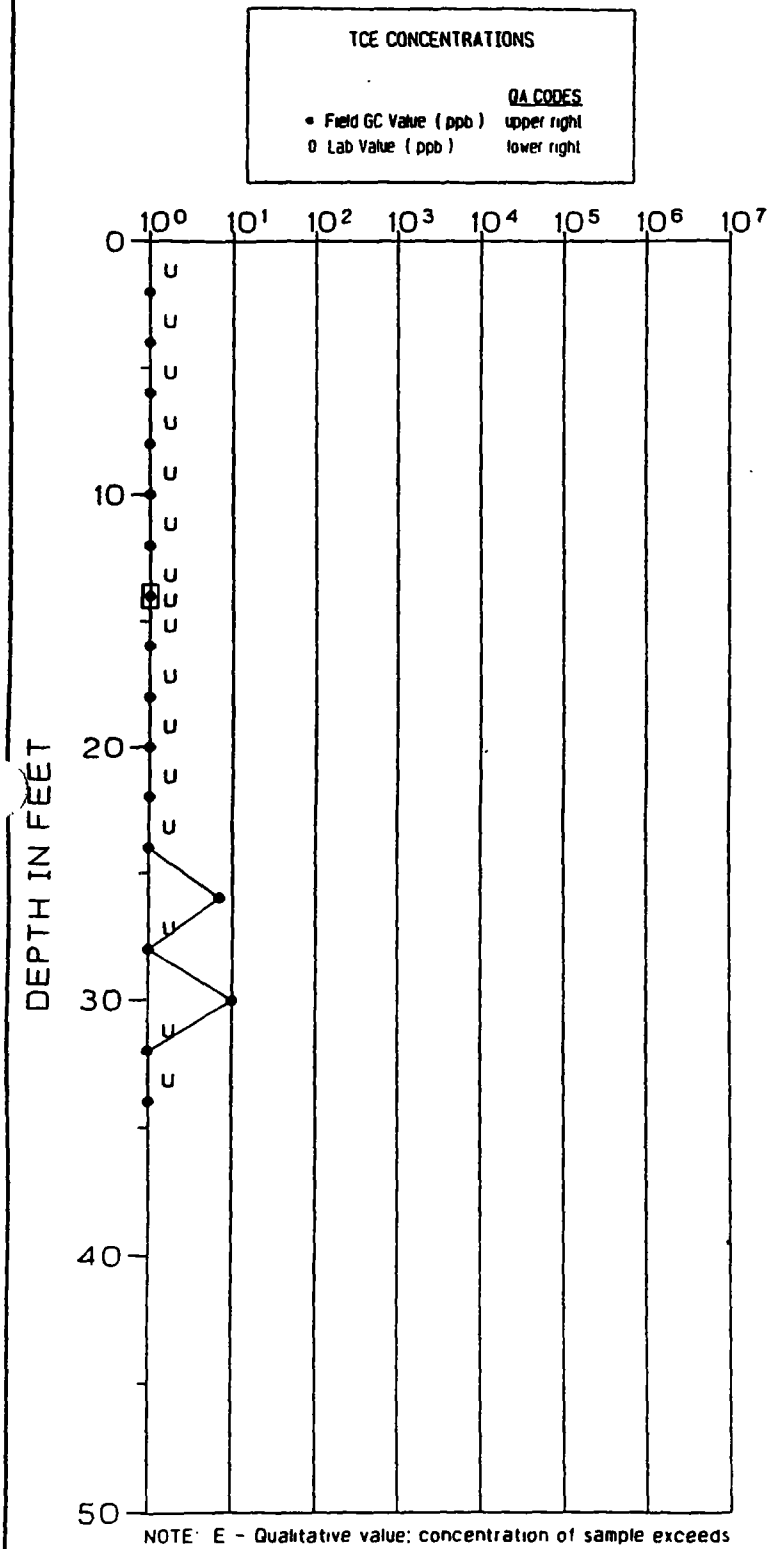
BORING LOG

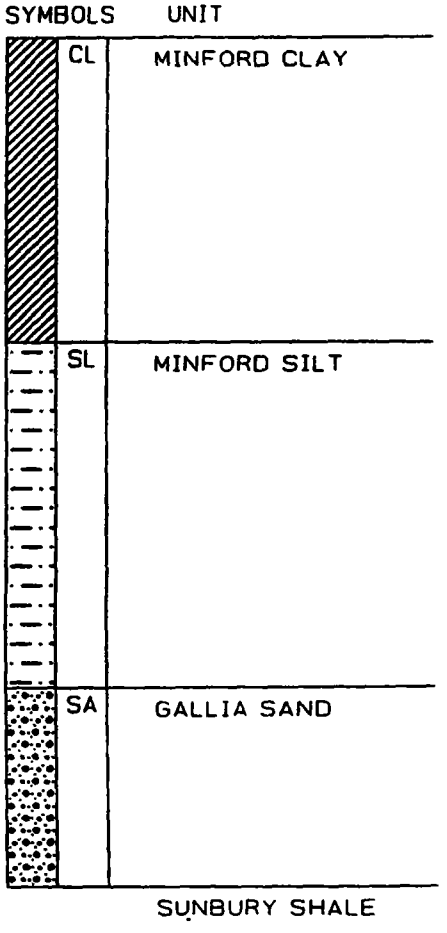
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. STSW-SB104

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/3/91
SURFACE ELEVATION: 669.60 ft. msld
TOTAL DEPTH: 33.5 ft.





TD = 33.5 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph
J - Qualitative value, not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

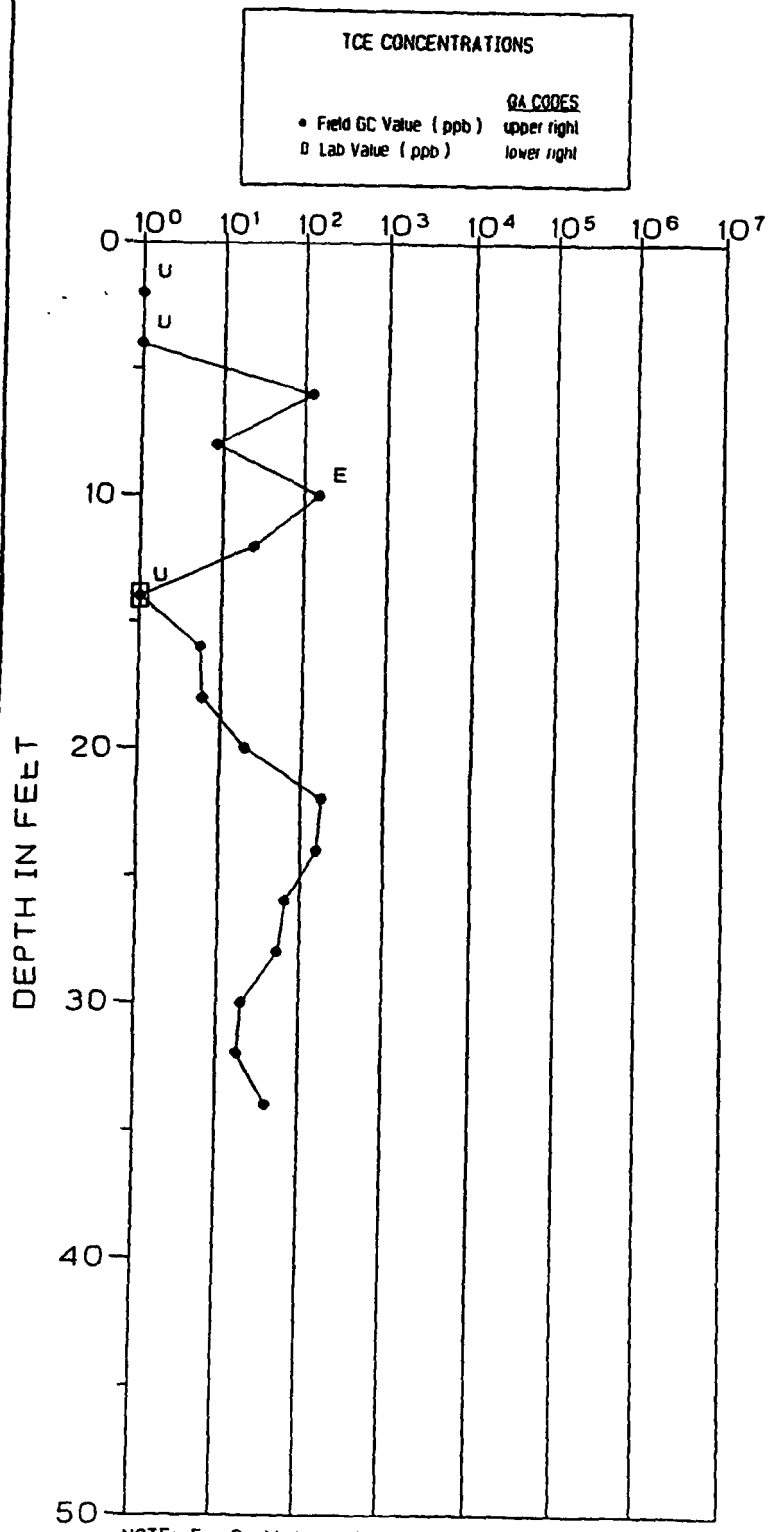
BORING LOG

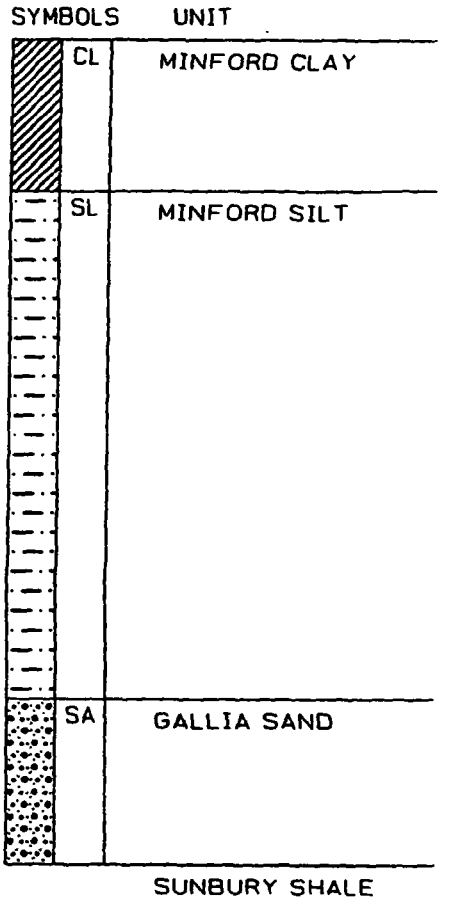
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB104

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/22/91
SURFACE ELEVATION: 670.50 ft. msld
TOTAL DEPTH: 32.5 ft.





TD = 32.5 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

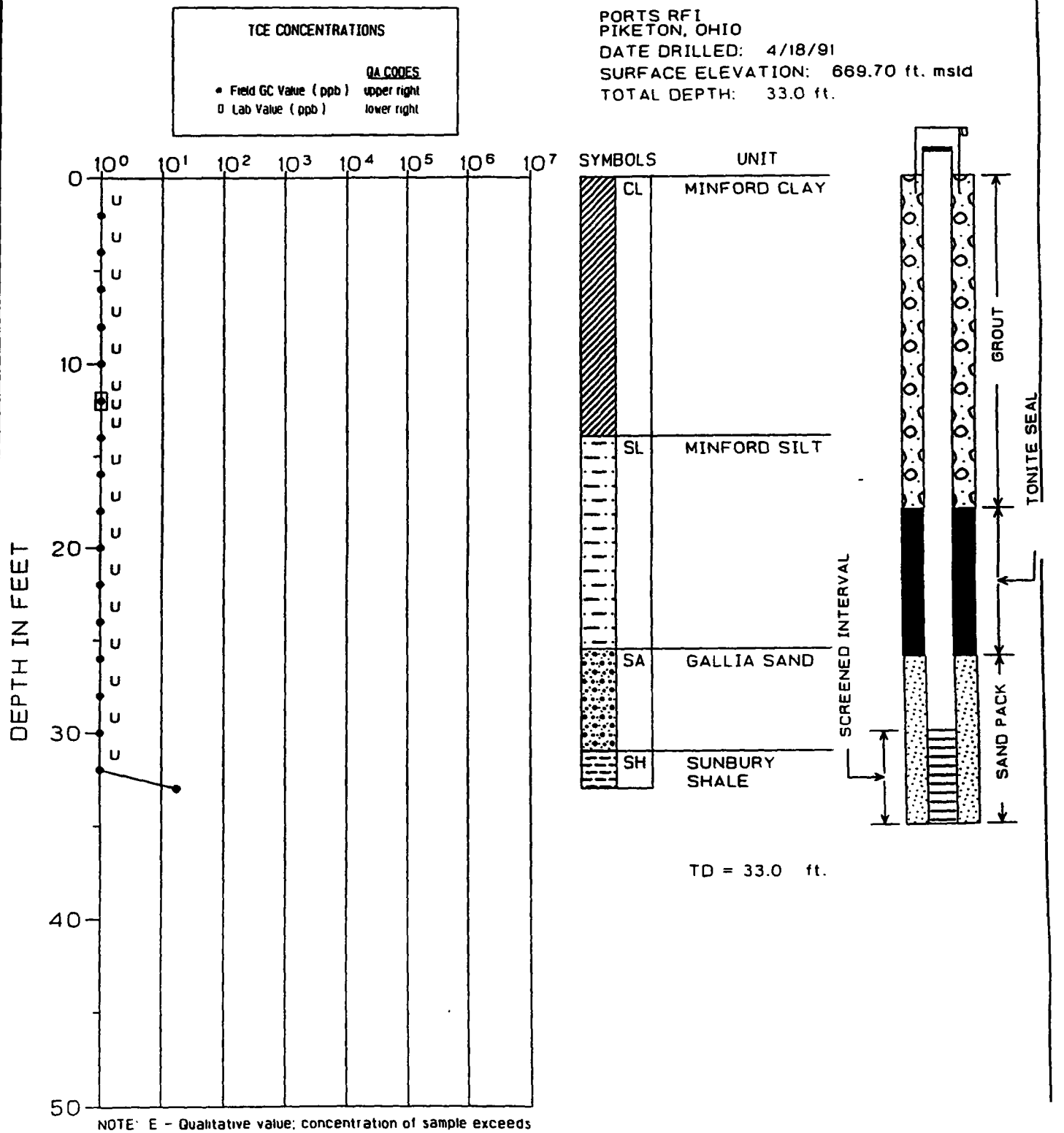
BORING LOG

Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. X626-01G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/18/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 33.0 ft.



NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value, not all quality control criteria met
M – Qualitative value; matrix problems encountered.
U – Analyte not detected
Q – Questionable peak
* – Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

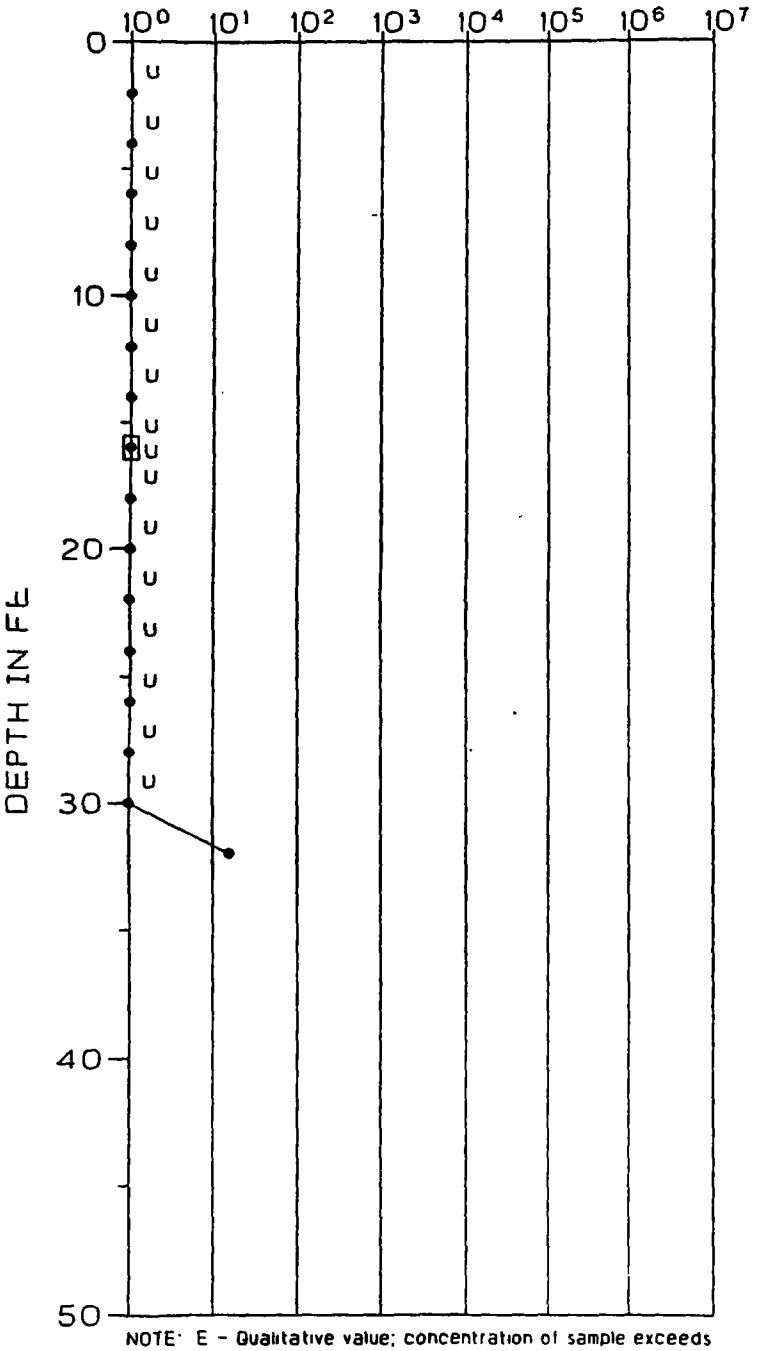
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

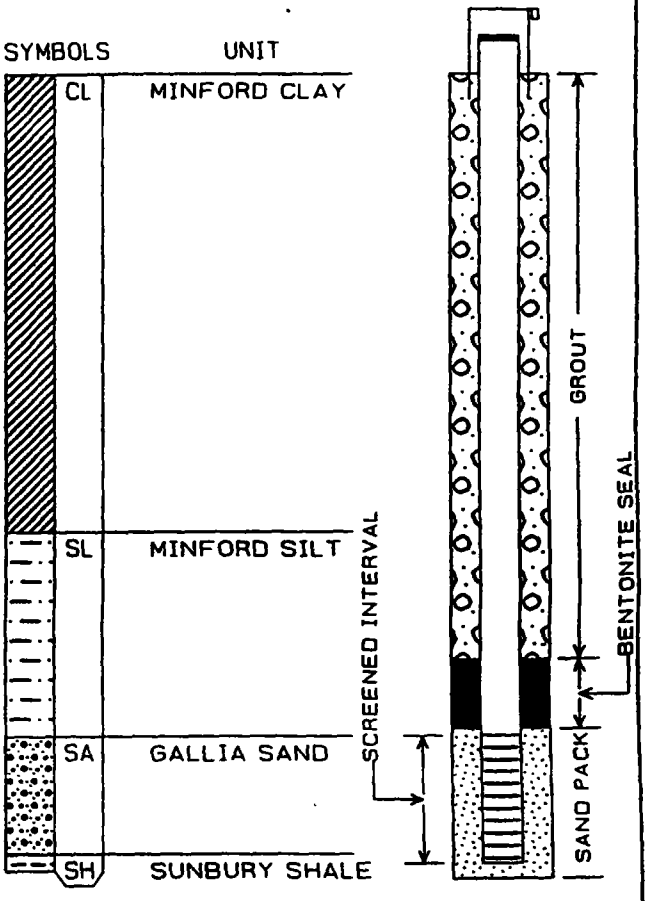
BORING NO. X626-07G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/16/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 31.3 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
0 Lab Value (ppb)	lower right





TD = 31.3 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

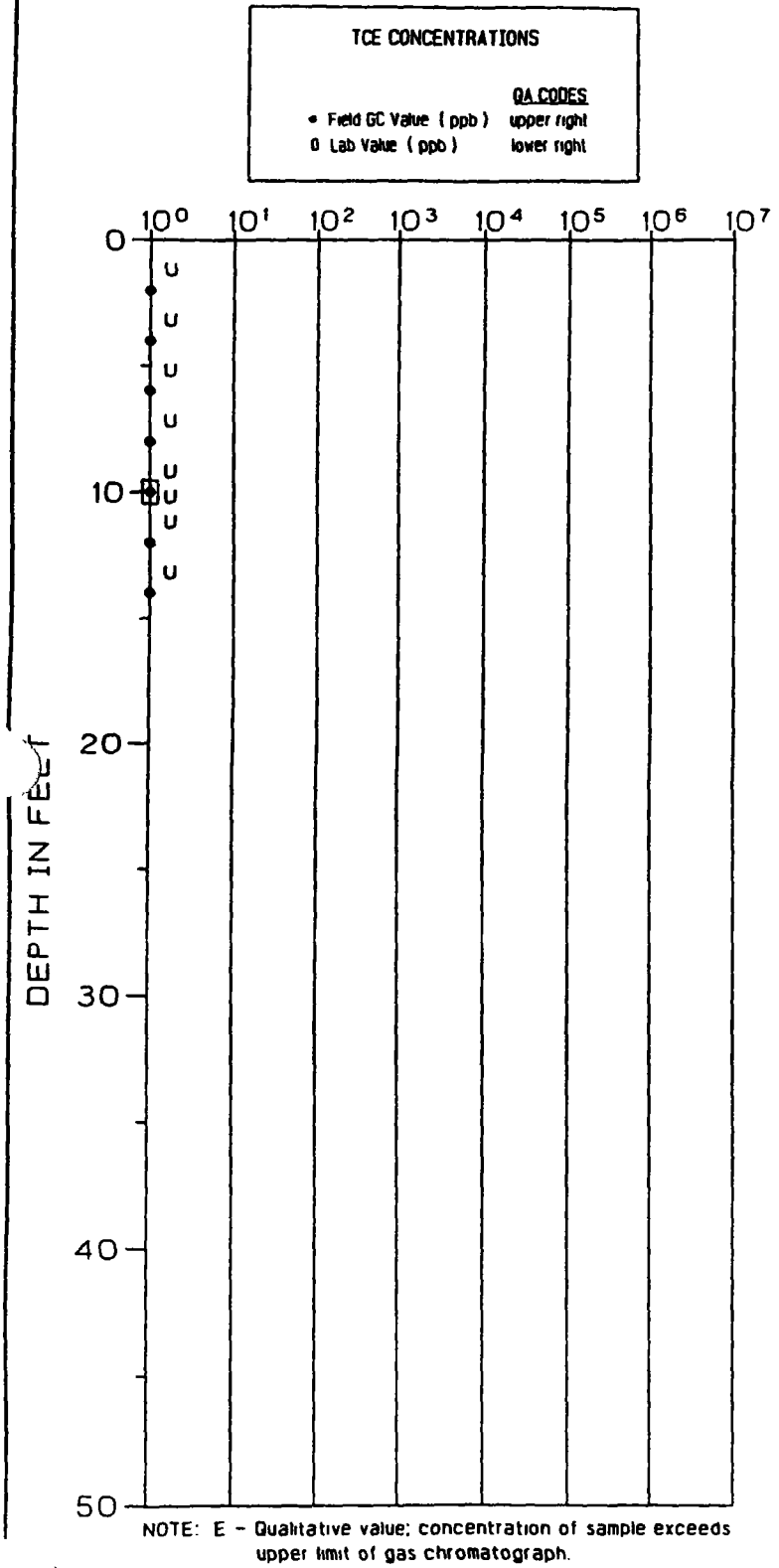
WELL LOG

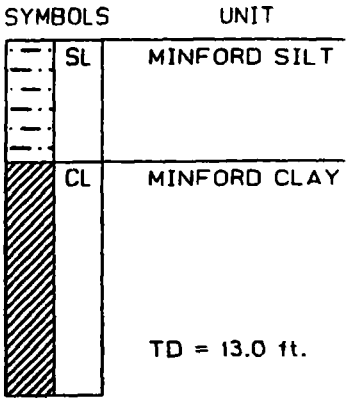
Geraghty & Miller Inc.
Environmental Services

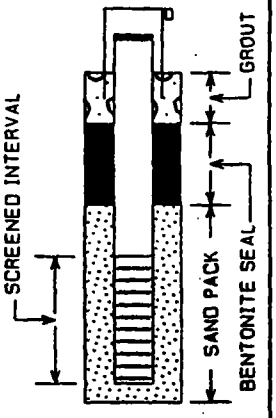
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. X626-06M

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/2/91
SURFACE ELEVATION: 670.10 ft. msld
TOTAL DEPTH: 13.0 ft.







NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered.
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

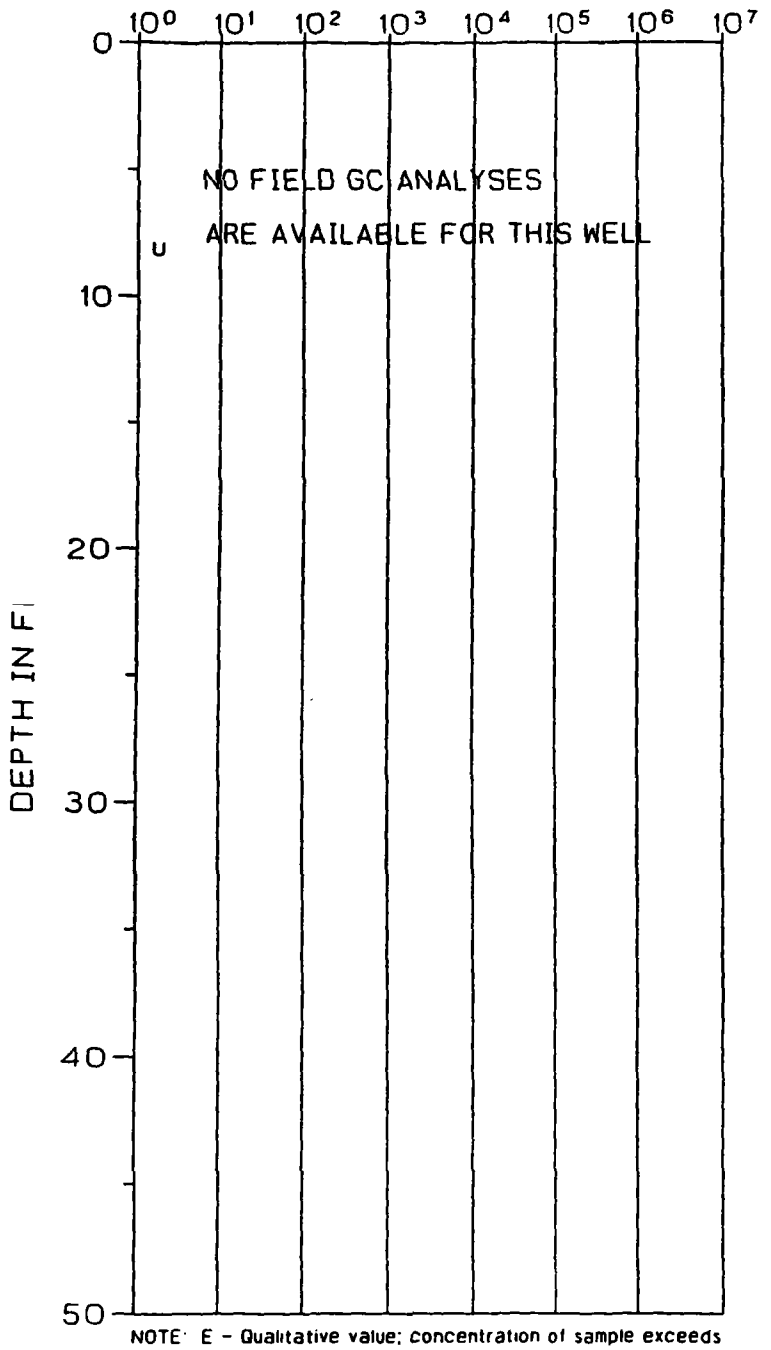
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

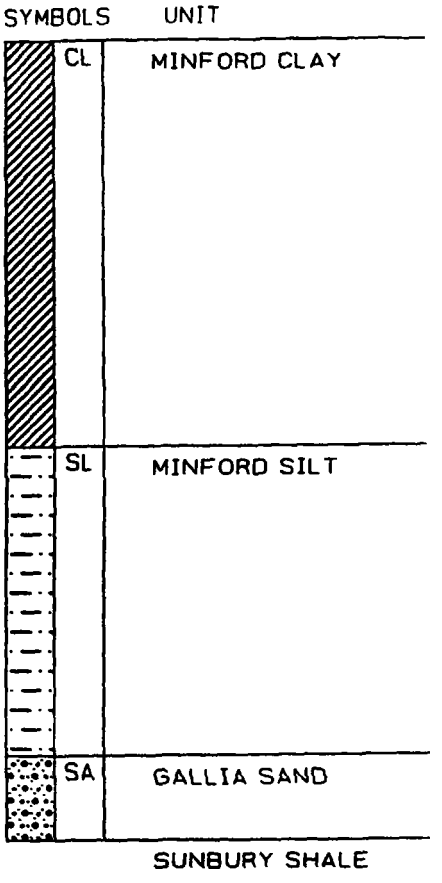
BORING NO. RCW-SB105

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/29/91
SURFACE ELEVATION: 670.10 ft. msld
TOTAL DEPTH: 31.5 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
□ Lab Value (ppb)	lower right





TD = 31.5 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered
U - Analyte not detected.
Q - Questionable peak
x - Unknown peaks

BORING LOG

Geraghty & Miller Inc.
Environmental Services

WELL F-19

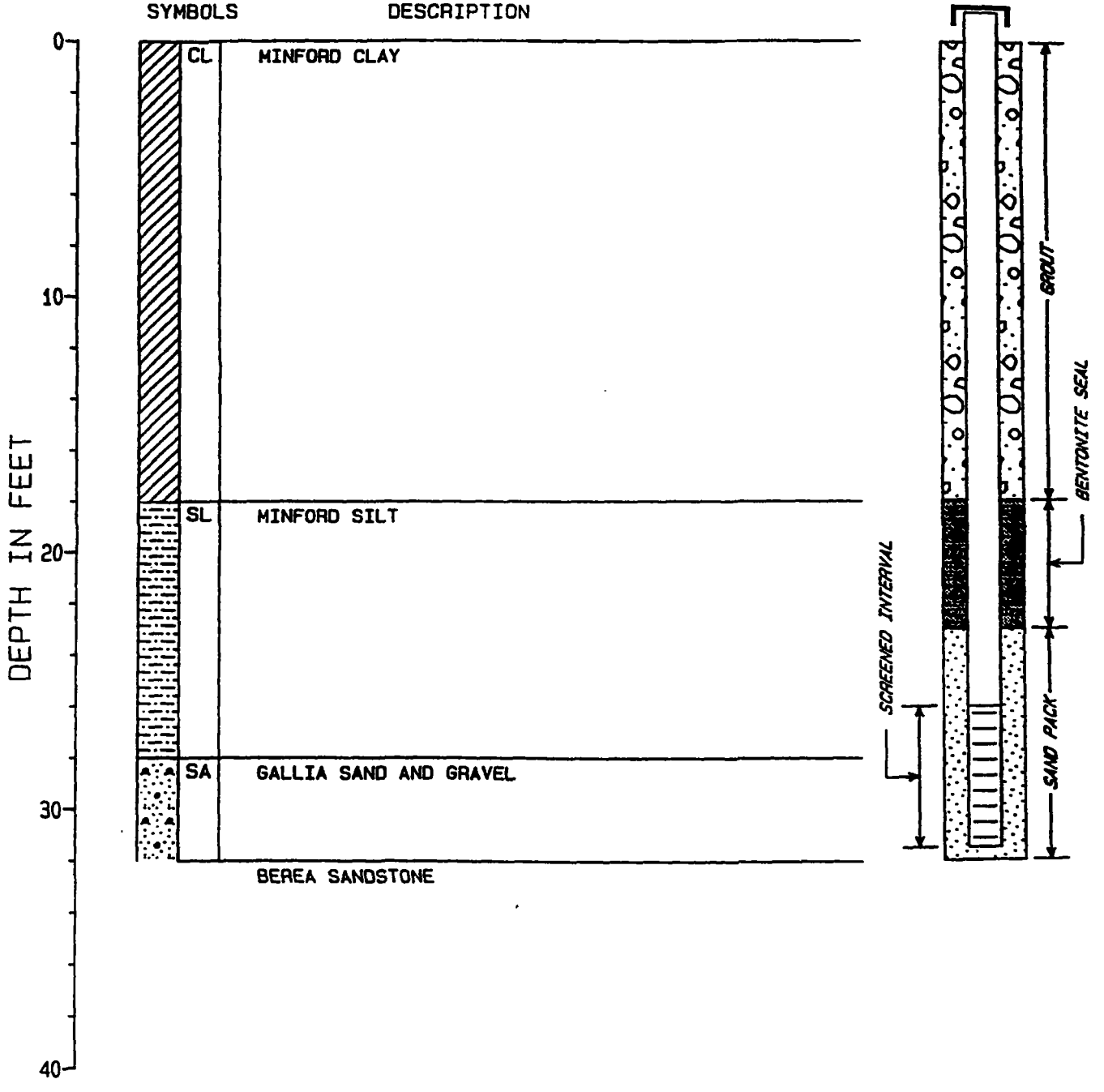
PORTS
PIKETON, OHIO

DATE DRILLED: 9/1/88

SURFACE ELEVATION: 675.82 ft. msld

TOP OF
CASING ELEVATION: 676.99 ft. msld

TOTAL DEPTH: 32.0ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL F-20

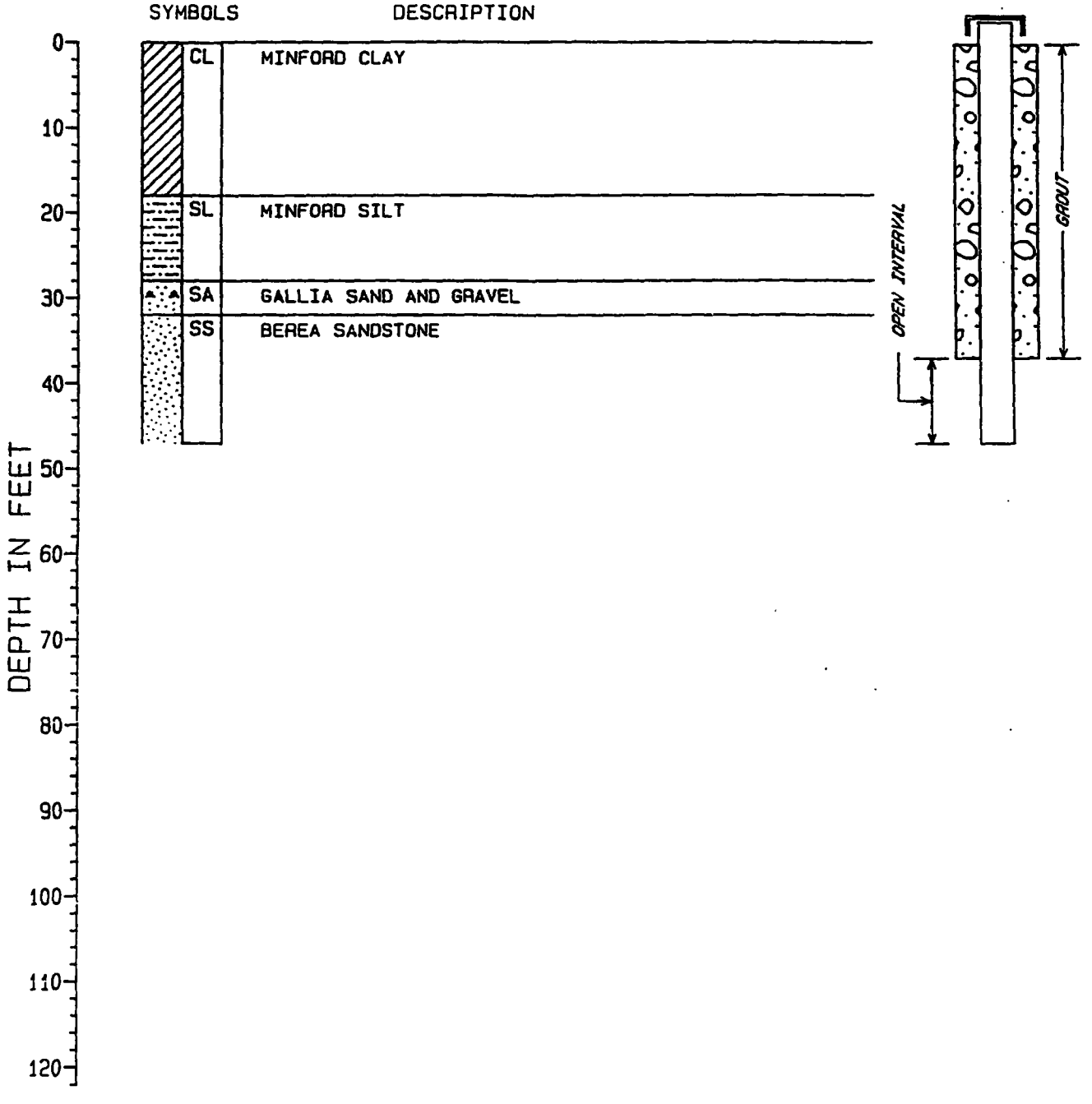
PORTS
PIKETON, OHIO

DATE DRILLED: 9/12/88

SURFACE ELEVATION: 675.72 ft. msld

TOP OF
CASING ELEVATION: 678.38 ft. msld

TOTAL DEPTH: 47.0ft. msld



WELL LOG

Geraghty & Miller Inc.

SUBMISSION DATE: February 21, 2000

APPENDIX C

X-326 Facility Closure Plan
Standard Operating Procedures

SUBMISSION DATE: February 21, 2000

SOP #1 - DECONTAMINATION OF TEFLON OR GLASS SAMPLING EQUIPMENT

EQUIPMENT:

_____ Micro solution
_____ Distilled water
_____ Log Book
_____ Brush

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long-term storage.

5. Record date, time and details of decontamination in log book.

SUBMISSION DATE: February 21, 2000

SOP #2 - DECONTAMINATION OF STAINLESS STEEL OR METAL SAMPLING EQUIPMENT

EQUIPMENT:

_____ Distilled water
_____ Brush
_____ Log Book
_____ Micro solution

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long term storage.

5. Record date, time and details of decontamination in log book.

SOP #3 - COLLECTION OF HAND-AUGERED SOIL/SEDIMENT SAMPLES

EQUIPMENT:

_____	Personal protective equipment	_____	Paperwork
_____	Plastic sheeting	_____	Pens/markers
_____	"Caution" tape and posts	_____	Sample bottles
_____	Stainless Steel Hand-Auger	_____	Waste containers
_____	Log book		

PROCEDURES:

Prior to Leaving Office:

A. Acquire necessary equipment and forms.

At Sampling Location:

1. Don appropriate PPE (See Health and Safety Plan)
2. Establish exclusion zone with barricade tape.
3. Set up monitoring equipment (PID and radiation meter)
4. Place plastic sheeting near work area.
5. Using stainless steel hand auger, collect soil or sediment samples from locations and depths prescribed in the Closure Plan.
6. Record all details of sample collection in log book.
7. Collect samples into appropriate bottles. Label each bottle with the following information: date, time of sampling, sample ID, analytical method, sampler initials and method of preservation. Print all information accurately and legibly. Complete chain-of-custody forms (see SOP #6).
8. Place samples in containers as needed, and pack with ice in coolers as soon as possible.
9. Label all waste drum(s) (see SOP #8).
10. Decontaminate the hand auger as outlined in SOP #2.

SUBMISSION DATE: February 21, 2000

SOP #4 - RINSEATE BLANK COLLECTION

EQUIPMENT:

_____ Distilled water

_____ Sample containers

_____ Log book

PROCEDURE - Re-Usable Equipment:

1. Decontaminate equipment according to SOP #1 or #2.

2. Following the final distilled water rinse, again rinse the sampling device with distilled water this time washing the rinseate into sample containers for laboratory analysis

3. All rinseate blanks must be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of rinseate blank collection in the log book.

QA/QC REQUIREMENTS:

One rinseate blank per ten investigative samples must be collected by the sampling team.

SUBMISSION DATE: February 21, 2000

SOP #5 - DUPLICATE SAMPLE COLLECTION

EQUIPMENT:

_____ Sample containers _____ Log book

PROCEDURE:

1. Immediately following sample collection, fill a second set of sample containers using the same order of sample collection and procedures.

2. Label the sample with its duplicate sample id.

3. All duplicate samples should be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of duplicate sample collection in the log book.

QA/QC REQUIREMENTS:

One duplicate sample per ten investigative samples must be collected by the sampling team.

SUBMISSION DATE: February 21, 2000

SOP #6 - CHAIN-OF-CUSTODY SAMPLE SHIPMENT PROCEDURE

PROCEDURE:

A chain-of-custody record must be completed for all samples immediately upon collection. Information to be provided on this form includes:

- Sample container volume;
- Project number and ID;
- Laboratory identification;
- Sampling personnel;
- Sample identification
- Sample container material;
- Sample preservation;
- Date and time of collection;
- Type of analysis to be performed;
- Analytical method number; and
- Shipment method and carrier

All samples should be packed in coolers with sufficient packaging to prevent damage to sample bottles during shipment. Frozen ice packs must be included in each sample cooler. Once the container is ready for shipment, a Chain-of-Custody seal should be applied in such a manner so as to monitor tampering.

Upon change of possession, the record is to be signed and dated by both parties. The white (original) copy accompanies the shipment.

SUBMISSION DATE: February 21, 2000

SOP # 7- COMPLETION OF REQUEST FOR DISPOSAL (RFD) FORMS

PROCEDURE:

1. After completing work or when drum is full, fill out RFD form items 1-2.

2. Mark RFD number on drum. If more than one drum will be accounted for on each RFD, mark the drums (i.e., 1 of 3 or 2 of 3) to ensure that all drums on each RFD form are handled.

3. Deliver all completed RFD forms to the designated waste management personnel.

SUBMISSION DATE: February 21, 2000

SOP # 8 - HNU PHOTOIONIZATION DETECTOR PROCEDURE

EQUIPMENT:

_____ HNU Model P1 101 (10.2 eV lamp)

_____ Calibrant Gases (Isobutylene: 20-200 ppm and 0-20 ppm)

_____ HNU Calibration Log

_____ Flow meter _____ Paperwork

PROCEDURES:

INSTRUMENT SET-UP:

1. Prior to calibration, check the function switch on the control panel to make sure it is in the OFF position. The probe nozzle is stored inside the instrument cover. Remove cover plate by pulling up on the pins that fasten the cover plate.

2. Remove the nozzle from the cover. Assemble probe by screwing nozzle into casing.

3. Attach probe cable to instrument box inserting 12 pin interface connector of the probe cable int the connector on the instrument panel. Match the alignment keys and insert connector. Turn connector in clockwise direction until a distinct snap and lock is felt.

4. Turn the function switch to the Battery Check position. When the battery is charged, the needle should read within or above the green battery arc on the scale plate. If the needle is below the green arc or the red LED light comes on, the instrument should be recharged prior to making any measurements.

5. Turn the function switch to the ON position. In this position, the UV light source should be on. To verify, gaze at the end of the probe for a purple glow. Do Not Look Directly at the Lamp Itself. If the lamp does not come on refer to the Instruction Manual.

6. To zero the instrument, turn the function switch to the standby position and rotate the zero potentiometer until the meter reads zero. Clockwise rotation of the zero potentiometer produces an upscale deflection while counter clockwise rotation yields a down scale deflection. (Note - No

zero gas is needed since this is an electronic zero adjustment.) If the span adjustment is changed during instrument calibration, the zero should be rechecked and adjusted. If necessary, wait 15 to 20 seconds to ensure that the zero reading is stable. Readjust as necessary.

INSTRUMENT DAILY CALIBRATION

1. Insert one end of T tube into probe. Insert second end of probe into calibration gas in the 20-200 p.m. range. The third end of probe should have the rotameter (bubble meter) attached.

2. Set the £unction switch in the 0-200 p.m. range. Crack the valve on the pressured calibration gas container until a slight flow is indicated on the rotameter. The instrument will draw in the volume required for detection with the rotameter indicating excess flow.

3. Adjust the span potentiometer so that the instrument is reading the exact value of the calibration gas. (Calibration gas value is labeled on the cylinder.)

4. Turn instrument switch to the standby position and check the electronic zero. Reset zero potentiometer as necessary following step 6 above.

5. Record on field-data sheet all original and readjusted settings.

6. Set the function switch to 0-20 p.m.. Remove the mid-range (20-200 p.m.) calibration gas cylinder and attach the low range (0-20 p.m.) calibration gas cylinder as described above.

7. Do not adjust the span potentiometer. The observed reading should be ±3 p.m. of the concentration specified for the low range calibration gas. If this is not the case, recalibrate the mid range scale repeating Step 1 thru 6 above. If the low range reading consistently falls outside the recommended tolerance range, the probe light source window likely needs cleaning. Clean window according to instruction manual. When the observed readings is within the required tolerances, the instrument is fully calibrated.

INSTRUMENT CALIBRATION CHECK:

1. Exit the exclusion zone and turn meter to "ON" position. Check that the meter is reading a value of zero.

2. Insert one end of T-tube into probe and other end into calibration gas. The third end of the T-tub should be attached to a flow meter

3. Crack the valve on the calibration gas and read the value shown by the instrument. Record the value and calibrant gas concentration and a field-data sheet.

4. If the value shown by the instrument is greater than ±20% of the calibrant gas concentration, take meter outside of exclusion zone and recalibrate as outlined above.

SAMPLE MEASUREMENT:

1. Place function switch in 0-20 p.m. range for field monitoring. This will allow for most sensitive, quick response in detecting airborne contaminants.

2. Before entering a contaminated area, determine background concentration. This concentration should be used as a reference to readings made in the contaminated area. Under no circumstance should one attempt to adjust the zero or span adjustments while the instrument is being operated in the field.

3. Take measurements in contaminated area, recording readings and locations. Should readings exceed the 0-20 scale, switch the function switch to the 0-200 or 0-2,000 range as appropriate receive a direct reading. Return the instrument switch to the 0-20 range when readings are reduced to that level. Record measurements on field-data sheet.

Note: The instrument will not function properly in high humidity or when the window to the light housing is dirty. If the instrument response is erratic or lower than expected, recalibrate or obtain a different meter and calibrate as outlined above.

4. When finished, reverse Steps 1 thru 6 in Instrument Setup section to shut down the instrument.

QA/QC Requirements:

The instrument must undergo a 2-point calibration as described above every morning before commencement of field work. In addition, a calibration check must be performed every hour during use of the instrument. The readings from the HNU will only be used in selection of proper PPE during field work and in selecting initial field-GC analytical parameters for sample analysis in the field.

REFERENCE: Modified from TSAI, U.S.EPA Region V, QAS.

SUBMISSION DATE: February 21, 2000

SOP #9 - COMBUSTIBLE GAS INDICATOR (MSA EXPLOSIMETERS - MODEL 2A)

EQUIPMENT:

_____ Calibrant Gasses - 40% LEL (Methane 2%)
- 50% LEL (Methane 2.5%)

PROCEDURES:

INSTRUMENT SET-UP:

The MSA Explosimeter is set in its proper operating condition by the adjustment of a single control. This control is a rheostat regulating the current to the Explosimeter measuring circuit. The rheostat knob is held in the OFF" position by a locking bar. This bar must be lifted before the knob can be turned from "OFF
position.

1. Lift the end of the rheostat knob "On-OFF" bar and turn the rheostat knob one quarter turn clockwise.

This operation closes the battery circuit (there will be an initial deflection of the meter pointer). The meter pointer may move rapidly upscale and then return to a point below ZERO, or drop directly below ZERO.

2. Flush fresh air through the instrument.

The circuit of the instrument must be balanced with air free of combustible gases or vapors. Five squeezes of the aspirator bulb are sufficient to flush the combustion chamber. If a sampling line is used, an additional two squeezes will be required for each ten feet of line.

3. Adjust rheostat knob until meter pointer rests at zero.

Clockwise rotation of the rheostat knob causes the meter pointer to move up scale. A clockwise rotation sufficient to move the meter pointer considerably above zero should be avoided as this subjects the detector filament to an excessive current may shorten its life.

Note:

When the meter pointer remains below zero and cannot be brought up to ZERO even when the control rheostat is turned to its extreme clockwise position, the batteries must be replaced.

If the pointer of the indicating meter moves to the extreme right side of its scale when the instrument is turned on and cannot be adjusted to ZERO, the detector filament may be burned out and should be replaced.

INSTRUMENT USAGE:

1. Readjust meter pointer to zero if necessary by turning rheostat knob.

2. Aspirate sample through instrument until highest reading is obtained .

Approximately five squeezes of the bulb are sufficient to give maximum deflection. If a sampling line is used add two squeezes for each ten feet of line. This reading indicates the concentration of combustible gases or vapors in the sample.

INSTRUMENT DAILY CALIBRATION:

1. Attach the flow control to the calibration gas tank.

2. Connect the hose to the flow control and to the instrument inlet fitting.

3. Open the flow control valve.

4. Record the meter reading after it stabilizes. NOTE: It is not necessary to operate the aspirator bulb to obtain the calibration sample. Depending on which calibration gas is used, the instrument reading should be within one of the following ranges:

   2.0% Methane: 42 to 60%
   2.5% Methane: 54 to 75%

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Attachments for Appendix I-1

Four oversize engineering drawing were the original attachments to this closure plan. These drawing are outdated and therefore are not included with the permit renewal application. The information provided on each drawing can be obtained in other locations as listed below:

Attachment I-1 Regional Topographic Map:	See Section B, Figure B-2
Attachment I-2 PORTS SWMU Map:	See PORTS RCRA Corrective Action Program documents
Attachment I-3 X-326 Hazardous Waste Storage Facility Floor Plan:	See Section D, Figure D-3 and Appendix D-1
Attachment I-4 X-326 Cross Sectional View:	See Section D, Appendix D-1

Closure Plan for the X-7725 Storage Unit

Portsmouth Gaseous Diffusion Plant

Date Issued — February 21, 2000

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

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under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

SUBMISSION DATE: February 21, 2000

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
COC	Chain-of-Custody
CPR	Cardiovascular Pulmonary Resuscitation
DAC	Derived Air Concentration
DBA	Decibel
dm	Decimeter
DOE	United States Department of Energy
DOT	United States Department of Transportation
dpm	Disintegrations per minute
EPA	United States Environmental Protection Agency
ESH	Environmental, Safety and Health
GCEP	Gas Centrifuge Enrichment Plant
HASP	Health and Safety Plan
HWP	Hazardous Work Permit
ID	Identification
IDLH	Immediately Dangerous to Life and Health
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MMES	Martin Marietta Energy Systems, Inc.
MPH	Miles per hour
mrem/hr	Millirem/hour
MSDS	Materials Safety Data Sheet
MSHA	Mine Safety and Health Administration
NCS	Nuclear Criticality Safety
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAL	Plant Allowable Limit
PCB	Polychlorinated biphenyl
PED	Plant Emergency Director
PELs	Permissible Exposure Limits
PID	Photo-ionization detector
PORTS	Portsmouth Gaseous Diffusion Plant
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAS	Quality Assurance Standard

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RCRA	Resource Conservation and Recovery Act
rem	Units of radiation
RFD	Request For Disposal
RFI	RCRA Facility Investigation
SCBA	Self Contained Breathing Apparatus
SOPs	Standard Operating Procedures
SSHO	Site Safety and Health Officer
SW-846	Publication of the U.S. EPA - Solid Waste Office
TLV	Threshold Limit Values
TSCA	Toxic Substances Control Act
U	Uranium
µCi/mL	Micro-Curie per milliliter
U.S.EPA	United States Environmental Protection Agency
UL	Underwriters' Laboratory
USCG	United States Coast Guard
U.S. GPO	United States Government Printing Office
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
"	inch
'	foot

CLOSURE PLAN FOR THE X-7725 STORAGE UNIT

1. FACILITY DESCRIPTION

1.1 General Description

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by DOE and is contractor managed by Bechtel Jacobs Company LLC. For the purposes of this permit application, DOE and Bechtel Jacobs Company LLC are Co-Operators of the X-326 and X-7725 Hazardous Waste Storage Units.

PORTS is located at 39°00'30" N latitude and 83°00'28" W longitude on a 3,714-acre federally owned reservation in Pike County, Ohio. Pike County, one of the state's lesser populated counties, encompasses an area of approximately 444 square miles. The site is located approximately equidistant between Chillicothe and Portsmouth, Ohio. The plant site is approximately 4 miles southeast of Piketon, Ohio, 1.5 miles east of U.S. Route 23, 2 miles east of the Scioto River, and 70 miles south of Columbus, Ohio (see Figure 1).

PORTS has operated since 1954, enriching uranium for national defense and commercial nuclear reactors. That enrichment is accomplished by the gaseous diffusion process. As of 1993, all uranium enrichment operations at PORTS are conducted by the United States Enrichment Corporation, formed as a government-owned corporation by the Energy Policy Act of 1992, that became private in July 1998. As such, DOE's mission at the PORTS site has changed to environmental restoration, waste management, removal of highly enriched uranium, and operation of nonleased facilities.

As a result of historical and current enrichment operations, and as is typical of large industrial plants, a wide variety of hazardous wastes are generated. These include analytical laboratory wastes, spent solvents, electroplating wastes, paint wastes, sludges, corrosive wastes, and environmental restoration generated wastes. Table 1 provides a listing of solid waste management units at PORTS.

The X-7725 Building was originally designed for Gaseous Centrifuge Enrichment (GCEP) activities. However, after GCEP was canceled in 1985, the X-7725 Building was selected as the site for hazardous waste container storage because it has a large area of floor space kept under climate-controlled conditions. The building consists of five floors with 20 acres of total floor space under roof. Approximately 9 acres of floor space are used for hazardous waste container storage activities. The building is divided into a number of rooms, staging areas, open bays, and offices (Fig. B-4).

The X-7725 Building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 11 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal downspouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled. ~~Heat is provided by recirculating heating water and cooling by chilled water systems.~~

Wastes that may be stored in the X-7725 Building hazardous waste storage areas include any of the waste codes listed in Part A of this application.

All hazardous waste storage areas in the X-7725 Building have berms to provide for a secondary containment capacity of 10% of the total waste volume of hazardous waste stored and 25% of the total waste volume where RCRA/TSCA wastes are stored. The floor of the X-7725 Building is free of cracks and gaps and is sealed with a chemically resistant sealant.

1.1.1 Topographic Map

The U.S. Geological Survey (USGS) topographic map for the facility is shown on Attachment I-1. Topographic details of the X-7725 Storage Unit area are shown on Figure 3.

1.1.2 Solid Waste Management Units

All Solid Waste Management Units (SWMUs) at the PORTS facility are noted as such on Table 1 and the units are shown on Attachment I-2. A detailed description and list of the wastes managed and/or disposed at these units is found in the PORTS RFI Description of Current Conditions (DOCC) for Quadrants I-IV. Section 6 of the Quadrant III DOCC provides detailed information for the X-7725 facility. Appendix A of this closure plan contains the title page and table of contents for the Quadrant III DOCC.

1.2 Hydrogeologic Information

1.2.1 Geologic and Hydrologic Settings

The PORTS facility lies near the western margin of the Appalachian Highlands within the Appalachian Plateau Province. The physiography of this area is typified by rugged, irregularly dissected hills and ridges separated by generally mature drainage systems. The topographic highs are erosional remnants of the more competent units of the Paleozoic bedrock which underlie the area.

The facility lies to the south of the terminus of Pleistocene glaciation, however, two distinct physiographic features of glacial origin are present in the area. The most prominent of these features are large flat expanses of glacio-lacustrine deposits which fill preglacial topographic depressions. Deeply incised stream valleys which formed during periods of high flow resulting from glacial meltwater are also present locally.

Most of these valleys are partially filled with alluvial material and many are occupied by streams which are orders of magnitude smaller than the ones which originally formed the valleys.

The PORTS facility is situated on one of the glacio-lacustrine deposits formed when drainage of the preglacial Teays River was obstructed and prehistoric Lake Tight was impounded. Lake Tight occupied both the main Teays River valley and many of its tributary valleys, including the Portsmouth and Newark River valleys. Fine-grained sediments accumulated within Lake Tight, forming lacustrine deposits of silt and clay up to 50 feet thick. Figure 4 exhibits regional

stratigraphic information at the PORTS facility.

Bedrock in the area consists of sedimentary strata of marine origin which were deposited during the Paleozoic Era. The formations which comprise the bedrock beneath the PORTS facility belong to the Waverly Group, and they are described below from the youngest to the oldest.

The Cuyahoga Formation is comprised of sandstone, conglomerate, and shale. Locally the Cuyahoga is predominantly composed of gray shale, and it is present on both the east and west side of the facility where it outcrops on the hills. The Cuyahoga formation is 250 to 300 feet thick.

The Sunbury shale is described as a hard, "bony", fissile shale. It is typically highly carbonaceous and black in color. The unit averages 20 feet in thickness throughout its known range, and it has been reported to have a maximum thickness of about 30 feet. However, the formation is highly variable, and in the vicinity of the PORTS facility the Sunbury averages only 8 to 10 feet in thickness. The Sunbury may have been removed from some areas due to erosion either before the deposition of the Lake Tight sediments (Teays formation) or in relatively recent times.

The Beret sandstone is comprised of a fine-grained sandstone interspersed with thin shale beds and laminae. The unit is gray to brown in color and 25 to 40 feet thick in the subject area. The sandstone beds range in thickness from 6 inches to 2 feet and are described as weather resistant, with regular jointing at right angles to bedding surfaces. In Pike County the uppermost 6 to 10 feet of the unit is massive with few bedding planes or shale laminae. Below this upper unit a 20 to 35 foot thick blue and gray sandstone interbedded with shale is present. This unit is reported to increase in shale content downsection so that it exhibits a gradational contact with the underlying Bedford shale.

The Bedford shale is a thinly bedded, calcareous shale interfingered with thin, fine-grained argillaceous sandstones. The unit ranges from 90 to 100 feet in thickness and has a blue-gray to red colored, clay-like shale comprising the upper zone. The lower portion of the unit is similar physically to the upper zone but is red in color.

The Paleozoic strata are inclined (dip) very slightly to the east, so that subsequent erosion, before the formation of Lake Tight, exposed the Sunbury shale in the eastern part of the area and the underlying Beret sandstone to the west. These formations thus comprise the bedrock in their former outcrop areas, now buried beneath the sediments of Lake Tight.

An assemblage of unconsolidated sediments, the Teays formation, covers the bedrock over much of the area of the PORTS facility. The Teays is comprised mainly of two members: the Gallia sand and the Minford clay. The Gallia sand is the basal unit, consisting largely of sand and gravel deposits of fluvial origin. Muscovite and feldspar are present as accessory minerals, and local bedrock fragments are common to the base of the unit in some areas. The Gallia is normally 5 to 10 feet in thickness, and it interfaces sharply with underlying bedrock. The Minford clay, overlying the Gallia member, consists of up to 40 feet of mostly lacustrine silty clay. The Teays formation represents the glacio-lacustrine sedimentary environment of the prehistoric Lake Tight. The thickness of the Teays formation is controlled by the topography of the erosional surface of the bedrock; it is thickest in low areas on the bedrock surface and may be absent on bedrock highs.

Two types of aquifers with differing hydrogeologic characteristics exist in the area of the facility: a bedrock aquifer and a complex alluvial aquifer. These water-bearing systems generally behave as two distinct and hydraulically separate aquifers; however, at some locations at the PORTS facility the two systems have been demonstrated to be interconnected.

The uppermost aquifer system in the area is the Teays formation which consists of unconsolidated Pleistocene valley fill comprised variously of clay, sand, silt, and gravel of both fluvial and lacustrine origins. This unit ranges in thickness from 0 to 50 feet primarily as a result of the underlying erosion surface. The aquifer system on the Piketon Reservation becomes more complex within the Big Run and Little Beaver Creek channels. These units are thin fluvial deposits, typically being only a few feet in thickness.

The alluvial aquifers are generally comprised of two separate units: a basal sand and gravel, and an overlying finer grained lacustrine deposit. The basal unit is the Gallia sand member. The Gallia sand grades upward from a coarse sand or gravel to a fine sand, and is composed primarily of subangular to subrounded quartz. The Minford clay (or Minford silt) member overlies the Gallia sand and consists of silt and laminated clays. This unit is generally 15 to 25 feet thick at the site but reportedly exhibits a maximum thickness of 80 feet in nearby locations.

Permeability in these alluvial aquifers is primarily a function of the intergranular pore space, and consequently it varies according to the nature of the sediments. The hydraulic conductivities of the various materials present ranges from 2×10^{-7} cm/sec for the lacustrine silts and clays to as high as 1×10^{-3} cm/sec for the sand and gravel.

The bedrock aquifer includes both sandstones and shales. Permeability in both rock types is mainly attributed to secondary porosity, resulting from fractures and fissures. No significant differences appear to exist in the permeabilities of the different rock types near the surface of the bedrock which are probably controlled by fractures. However, as the degree of weathering decreases and overburden pressure increases with depth, the aperture of the fractures that compose the secondary porosity system may decrease. Therefore, the components of the primary porosity system, grain size, grain shape and packing arrangement, may exert a greater influence over hydraulic conductivity as the distance from the surface of the bedrock becomes greater. Packer tests indicate that the Beret sandstone is more permeable than the Bedford shale. The Bedford shale has an average hydraulic conductivity of 2.66×10^{-5} cm/sec in the vicinity of the site. Hydraulic conductivities on the order of 10^{-4} cm/sec have been reported for the Beret sandstone in this area.

The Sunbury shale is present beneath the X-7725 building along the eastern margin of Quadrant III. However, to the west of the building the Sunbury is not present. Beneath the Gallia, the Sunbury shale where present, acts as a barrier to the vertical flow of groundwater thereby inhibiting the contamination of the Beret. The lower vertical boundary is the Bedford shale which lies beneath the Beret. The unit is composed primarily of shale and also limits the downward flow of groundwater. This is true for all quadrants.

Near the X-7725 facility, the Minford clay is approximately 12 to 32 feet thick and the Minford Silt is approximately 10 to 16 feet thick. Both the clay and silt thin to the westnorthwest. The Gallia formation is estimated to be approximately 3 to 7 feet thick. The Sunbury Shale forms the upper

bedrock surface at an average depth of 20 feet.

The ground water flow directions in the area of X-7725 in the Gallia and the Beret aquifers were analyzed using water levels measured on December 12, 1988. The flow directions in both units are consistent with a general northwestern hydraulic gradient. Stratigraphic and construction logs of the wells are included in Appendix B.

1.3 X-7725 Storage Unit Description

1.3.1 Waste Managed

The waste that may be stored in the X-7725 building are the following: product and process wastes, RCRA characteristic wastes, low level radioactive wastes (contaminated primarily with uranium and/or technetium), TSCA wastes containing PCBs or asbestos, and combinations of the above wastes. The majority of these wastes are liquid containing arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and benzene, spent halogenated and non-halogenated solvents, and/or radioactive wastes generated from laboratories wastes, decontamination solutions, and a variety of plant processes and clean-up operations.

During the operational life of the X-7725 Storage Unit, documented mixed waste containing RCRA constituents included aqueous laboratory solutions, spent laboratory solvents, and decontamination solutions from several other buildings on the plantsite. All of the laboratory solutions, aqueous and organic, result from the chemical analysis of uranium bearing mixtures/compounds. These wastes may be characteristically ignitable or corrosive, hazardous by the toxicity characteristic, or listed as hazardous.

Wastes stored in the X-7725 Storage Unit may include:

D001 Ignitables
D002 Corrosive (acid and alkaline)
D003-D043 TC Characteristic
F001
F002
F003
F005
F007
Various P and U Wastes
Radioactive RCRA Wastes
TSCA/RCRA Mixed Wastes*
Radioactive TSCA/RCRA Mixed Wastes~

* Note - Storage area will store PCB waste if waste is RCRA hazardous.

Table 2 lists the maximum number of containers for each waste type. The wastes are stored in either DOT approved 55 gallon 17C or 17E drums, 5 inch diameter/10 Liter polyethylene bottle, 4'x4'x6' boxes or various other containers as delineated in Table 2. The drums are stored on wooden pallets

of poly-pallets, which prevent contact with potentially inadvertent standing liquid introduced into the area.

1.3.2 X-7725 Storage Unit Description

The X-7725 building was originally constructed to house the recycle and assembly operations for the Gas Centrifuge Enrichment Plant (GCEP), which was canceled by DOE in 1985. The building consists of five floors with 20 acres of total floor space, approximately 9 acres of which is suitable for waste storage. There are areas for receiving and storing materials, testing and inspection of parts, and manufacturing/assembly of machines. Consequently the building is divided into a number of rooms, staging areas, open bays, and offices.

The X-7725 building had been selected to store RCRA hazardous wastes since it has a large area of floor space kept under climate-controlled conditions and can meet applicable Part 264 RCRA standards. The area immediately surrounding the building has been graded to prevent run-on of rainwater. The X-7725 building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 20 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal down-spouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. ~~The entire building is climate-controlled. Heat is provided by recirculating heating water, and cooling by chilled water systems.~~

Twenty-two areas located on the first and fourth floor of Building X-7725 (see Attachment 1-3 and 1-4) have been modified to accommodate mixed waste storage. A summary of the floor area for each storage area is provided in Table 5.

All storage areas of the X-7725 building have dikes to ensure an adequate containment capacity of 10% of the total waste volume stored. The floors of the X-7725 building are free of cracks and gaps. Rough or spalled areas of the floor are repaired with a polymer-modified Portland cement. Cracks in the floor are sealed with a modified-methacrylate crack healer/penetrating sealer, or an epoxy injection adhesive as appropriate for the number and size of the cracks. Expansion joint gaps are filled with a polyurethane elastomeric sealant. Control joint gaps are filled with a flexible epoxy control joint sealer/adhesive. To further ensure the base is capable of containing any liquids which may accumulate, the floors in all storage areas are sealed with a chemically resistant sealant.

All containers are elevated to prevent contact with any liquids which may accumulate in the containment areas. The containers are elevated on wooden pallets or poly-pallets. The poly-pallets, polyethylene spill containment pallets are for the storage of all liquid wastes when available.

Small spills or leaks of liquid waste are removed by adsorbents. The contaminated adsorbent is then placed in a suitable container and handled as hazardous waste. Larger spills will be pumped into a new container and residual liquid will be adsorbed and the adsorbent placed into suitable container.

1.4 References to Other Environmental Permits

The PORTS facility operates in conformance with requirements established by a number of federal

and state statutes and regulations, Ohio EPA Directors Findings and Orders, Executive Orders, DOE Orders, permits and/or submitted applications criteria, and compliance and settlements agreements. The PORTS facility maintains compliance status with regard to major environmental statutes under the following: Ohio EPA air permits and registered air emission sources; National Pollutant Discharge Elimination System (NPDES) permit 0IO00000; a Part B Permit; TSCA regulated storage areas; and Ohio State Fire Marshal Underground Storage Unit (UST) Registrations.

1.5 Anticipated Waivers or Exemptions

No waivers or exemptions are anticipated to be requested or required for the closure of this facility. The PORTS facility, including the X-7725 Storage Unit, is owned by the U.S. Department of Energy, a Federal Agency.

1.6 Closure and Post-Closure Cost Estimates

In accordance with Ohio Administrative Code (OAC) 3745-55-40(C), closure and postclosure cost estimates are not required for this Federal Facility.

1.7 Financial Assurance

In accordance with OAC 3745-55-40(C), financial assurance is not required for this Federal Facility.

1.8 Liability Coverage

In accordance with OAC 3745-55-40(C), liability coverage is not required for this Federal Facility.

2. CLOSURE PROCEDURES

The closure described in this plan is intended to minimize the need for further maintenance. It eliminates -- to the extent necessary to protect human health and the environment -- post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. Closure will be accomplished by the removal of waste and decontamination of the X-7725 Storage Unit floors, curbing and associated surfaces.

2.1 Estimate of the Quantity of Inventory to be Removed

The maximum capacity of the X-7725 Storage is summarized in Table 3. Waste stored in the X-7725 Storage Unit are discussed in Section 1.3.1.

2.2 Procedures for Handling Removed Inventory

All wastes at the facility will either undergo on-site treatment to render wastes nonhazardous and remain on-site, or be disposed at a facility permitted to receive waste (e.g., RCRA TSDF, TSCA incinerator). All wastes will be disposed in strict compliance with all applicable environmental regulations. Any wastes removed from the facility for disposal will be removed in an acceptable manner to transportation vehicles appropriate for waste transport. All transportation will take place via hazardous waste transporters registered with the Public Utilities Commission of Ohio and U.S. EPA and possessing a registration number from each of these entities. All waste disposed will be manifested using the uniform hazardous waste manifest (U.S. EPA form 8700-22 and 8700-22A) in accordance with Ohio Administrative Code 3745-52-20 before transportation off-site.

2.3 Procedures for Decontamination and Disposal

2.3.1 Surface Decontamination

The X-7725 Storage Unit storage area surfaces consist of urethane painted/coated concrete surfaces and associated diking. The urethane material is extremely resistant to chipping and cracking. Structural joints are filled with a caulking which is also extremely resistant to cracking.

Each of the twenty-two storage areas of the X-7725 Storage Unit will be decontaminated as discussed. Initially, those areas where PCB and PCB-contaminated waste were stored will be sampled for PCBs to determine if PCB contamination exists. Standard 100 cm^2 wipe samples will be randomly collected in accordance with 40 CER 761.125 (PCB Spill Cleanup Policy). Additional samples will be collected from areas that appear stained as identified by a certified professional engineer. Any areas exhibiting PCB contamination above 10 $\mu g/100\ cm^2$ (the clean level for PCBs under 40 CFR 761.125) will be decontaminated according to procedures specified in 40 CFR 761.125 before undergoing RCRA decontamination. Upon completion of these procedures, the areas will undergo additional RCRA decontamination procedures.

Prior to decontamination of a storage area, the area will be divided into zones for decontamination verification. Before decontamination procedures begin, a certified professional engineer will

determine the perimeter of the zones based upon visual inspection. Areas of apparent surface staining, contamination or structural faults will be noted for special evaluation in zone and/or sampling consideration. The inner surfaces of the diked outer periphery of the storage areas will be decontaminated. Materials such as sorbent sausages and/or pads will also be placed in areas being decontaminated on the top of the dike, outer surface and outer flooring to protect these areas from splashing that might potentially occur during the decontamination process. To decontaminate the X-7725 Storage Unit, personnel will use a brush, mops, and/or a high pressure hot water spray to wash down the floor. All decontamination procedures will strictly adhere to the health and safety requirements outlined in the X-7725 Storage Unit HASP (Section 4.0). Minimal detergent solutions will be used to facilitate the proposed treatment of any generated liquid waste. As the floor is cleaned, the liquid spray will be collected and placed into containers. The areas where the contaminated material and liquid wastes are transferred to containers will be curbed and overlain with Visqueen plastic or equivalent sheeting to provide spill containment.

Chemical analysis of the final rinseate will be used to determine if sufficient decontamination of the surfaces has taken place. A final rinseate sample for analysis will be collected from each of the divided zones. The liquid rinseate will be analyzed for the parameters listed in Table 4. The X-7725 Storage Unit surfaces will be considered clean when concentrations of liquid hazardous waste or hazardous waste constituents fall below:

a) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous waste constituents as listed in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics;

b) If an MCL is not available for a particular contaminant, then fifteen times the maximum contaminant level goal (MCLG) as listed in 40 CFR 141.50 shall be used as the clean standard: and

c) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor an MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

After the surface decontamination is completed, floor joints, if any, will be visually inspected for their integrity and tested for contamination under the supervision of a certified professional engineer. Those joint areas that exhibit the poorest integrity and visual contamination will be randomly sampled to verify no contamination. A total of five rinseate samples will be randomly collected and analyzed for those constituents in Table 4.

If the analysis indicates contamination still exists at the joints, any joint sealer will be removed and containerized and the joint inspected for visible contamination. If visible contamination is identified, the contaminated areas will possibly be removed by chipping, scabbling or a similar procedure. If contamination is exhibited beneath the depth of the slab, a soil core sample will be collected beneath the contaminated area. If chipping, scabbling or a similar procedure and core sampling is necessary, steps to minimize or eliminate fugitive dust air emissions, such as wetting with a fine water mist or construction of plastic sheeting enclosures, will be taken if necessary. Air sampling and monitoring will occur in areas and will adhere to procedure specified in section 4.4

of the HASP contained in this document. All debris removed will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers and disposed as discussed in section 2.3.2.

If any jointed areas exhibit contamination and integrity breaks after decontamination, they will be inspected and investigated as outlined above.

If the analysis indicates contamination still exists on the floor, the decontamination procedure will be duplicated. If analysis indicates contamination still exists, the contaminated floor areas will be subjected to scabbling or a similar procedure to remove the contamination. If scabbling or a similar procedure is necessary, steps to minimize or eliminate fugitive dust air emissions as discussed previously will be taken. Debris removed will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers and disposed as discussed in section 2.3.2.

A maximum volume of 8,000 gallons of rinseate/waste water is estimated to be generated by the above processes.

All workers involved in decontamination of the X-7725 Storage Unit surfaces will comply with the health and safety procedures outlined in the X-7725 Storage Unit Closure HASP contained in Section 4.0.

2.3.2 Solid Treatment or Disposal

At completion of closure for the X-7725 Storage Unit, all non-disposable equipment including power tools, hand tools, hoses and other miscellaneous equipment will be decontaminated in a previously constructed decontamination area that is curbed and overlain with Visqueen plastic sheeting to provide containment following the procedures outlined in Appendix C.

Disposable equipment and supplies generated during the X-7725 Storage Unit closure will not be decontaminated but will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers on a daily basis. At project completion, all containers with disposable equipment/supplies will be disposed at an offsite facility in accordance with all applicable disposal regulations (e.g., RCRA, TSCA, NRC). Any additional solids removed such as concrete, paint chips or sealant pieces will be subjected to laboratory waste characterization and disposed as hazardous waste or as low-level radioactive waste, depending on the radioactivity of the material. It is estimated a total of 2,000 pounds of wastes will be generated in the above processes.

2.3.3 Rinseate Treatment or Disposal

All liquid wastes generated during the X-7725 Storage Unit closure will be managed initially as hazardous waste. Each drum of rinseate/waste water generated during decontamination will be tested for parameters listed in Table 4 to document the extent of contamination and insure levels are acceptable for treatment described herein. Rinseates will then be managed as a waste water and treated through one of the facility's NPDES permitted treatment systems. Rinseate will be managed in strict compliance with the Clean Water Act. It is estimated a maximum of 8,000 gallons of liquid waste will be treated in this manner.

Rinseate may also be managed as a radioactive waste and not discharged to an NPDES treatment system depending on the radioactivity, if any, of the rinseate.

2.3.4 Soil Sampling and Analysis Program

Because the X-7725 Storage Unit storage floor surface areas consist of a layer of concrete 6 to 7 inches thick, it is extremely unlikely that a crack could develop that would allow migration of wastes to soils below. To further ensure that the floors are capable of containing liquids, they have been sealed with a chemically resistant sealant. Therefore, no soil sampling will be conducted as part of this closure. If sampling procedures discussed in Section 2.3.1 indicate unexpected contamination, PORTS will immediately contact the Ohio EPA to discuss amending the closure plan.

2.4 Description of Security System

PORTS is a controlled access facility with fencing, gates, and numerous other features that contribute to the safety and security of the facility. Security is maintained by a staff of trained security guards 24-hours a day. Routine patrols of areas outside the main complex are conducted at a minimum of once every eight hours. All security guards are equipped with two way radios and have direct communication with other protection personnel (i.e. fire department, shift superintendents, and the plant communications center). Employees are required to show identification badges when entering all main complex gates. Visitors and contractors entering the main complex must sign a log sheet and/or obtain proper passes.

2.5 Closure Certification

Within sixty (60) days of final closure, the owner/operator and an Independent Certified Professional Engineer will submit a certification of closure to the Ohio EPA Director by registered mail, assuring that the closure has been performed and is in accordance with the approved closure plan.

2.5.1 Activities to be Conducted

The performance standards to be used in evaluating activities proposed in Section 2.2 and 2.3 are the detection limits of the individual hazardous chemicals. Samples will be collected from decontamination rinseate.

2.5.2 Testing and Analysis to be Performed

The sampling and analysis protocol for activities proposed in Section 2.2 and 2.3 will generally follow the requirements of SW-846 and the SOPs in Appendix C. All laboratory sample analytical methods will follow a specific quality assurance and quality control plan.

2.5.3 Criteria for Evaluating Adequacy

The activities proposed in Section 2.2 and 2.3 will be evaluated by an Independent Certified

Professional Engineer. The Independent Certified Professional Engineer will be required to submit a report of findings and recommendations.

2.5.4 Schedule of Inspections

The areas where the activities proposed in Section 2.2 and 2.3 are to be conducted will be inspected by the independent engineer routinely. Upon the beginning of closure operations, the independent engineer will notify the Ohio EPA (District and Central Office) five days prior to any critical activity and will inspect all closure activities on a daily basis. All observation and inspection activities will be recorded in the engineer's log book. This schedule will continue until the activity has been completed, all hazardous waste has been removed, any contaminated soil or rinsewaters have been removed, and the sampling protocol has been completed. In addition to the closure performance inspection, PORTS health and safety, and building custodian personnel will be inspecting the X-7725 building closure area.

2.5.5 Types of Documentation

Documentation which will be included in the closure certification report will include the sample analysis information, volume of waste generated during closure, waste shipping records, spill/leak reports, all sample and decontamination procedures documentation (Chain-of-Custody (COCs), sampling logs, etc.), routine and special inspection records, photography, the approved closure plan and other related documents. In addition, the closure certifications report will contain any correspondence with outside agencies and independent evaluations which relate to the closure activity.

3. CLOSURE SCHEDULE

3.1 Expected Year of Closure

The X-7725 Storage Unit is expected to undergo closure in the year 2041 upon notification of intent to close according to the schedule outlined in Table 6.

3.2 Frequency of Partial Closure

There will be no partial closure for the X-7725 Storage Unit.

3.3 Waste Removal

The X-7725 stored hazardous waste will be shipped to a permitted Treatment, Storage, and Disposal (TSD) Facility on a routine basis and will be completed at 90 days after receipt of final volume of hazardous waste, assuming all wastes are characterized and the containers are adequate for shipping. Organic waste will be disposed in accordance with applicable treatment techniques. Aqueous inorganic mixed waste may be treated on-site to allow low-level radioactive waste disposal. Any remaining waste at the time of closure will be removed accordingly. The schedule for waste removal is illustrated in Table 6. Waste removal will begin in the year 2041 and will be completed 90 days after the start of removal.

3.4 Closure Completion

Closure is expected to be completed within 180 days of beginning closure under an Ohio EPA approved plan. Although no time extension requests are anticipated, if one should become necessary, it will be requested in accordance with demonstration requirements specified in OAC 3745-66-13.

3.5 Certification of Closure

Within 60 days of successful completion of the prescribed closure, the Department of Energy will submit to the Director of the Ohio EPA, by registered mail, a certification that the X-7725 unit has been closed in accordance with the specifications in the approved closure plan. In addition, the Regional Administrator, U.S. EPA Region V will be sent a copy. The certification statement will include the exact wording found in OAC 3745-50-42(D). The certification will be signed by the owner and by the Independent Certified Professional Engineer responsible for closure oversite, registered in the State of Ohio.

3.6 Survey Plat

Since the closure of the X-7725 Storage Unit is expected to be "clean," filing a survey plat is not expected to be required. Should it be determined that a clean closure cannot be accomplished, the Department of Energy will immediately contact the Ohio EPA to discuss amending the closure plan. If it becomes necessary, a survey plat will be submitted to the Pike County Recorder's Office and the Director of the Ohio EPA, which indicates the location and dimensions of the unit with respect

to permanently surveyed benchmarks. The plat would be prepared and certified by a professional land surveyor. The plat would contain a note, prominently displayed, which states the owners obligation to restrict disturbance of the hazardous waste unit.

3.7 Request for Extension to Deadlines for Handling Inventory or Completing Closure

There are no extensions needed at this time.

3.8 Milestones

Table 6 exhibits the time required for each phase of the X-7725 Storage Unit closure.

4. HEALTH AND SAFETY PLAN

A general Health and Safety Plan (HASP) has been developed for closure of the X-7725 Storage Unit at PORTS. The HASP presents the procedures to be followed which will achieve compliance with applicable federal, state and local regulations.

Prior to commencement of any closure field activities, a detailed and site specific HASP will be required to be submitted by the contractor selected to perform these closure activities. The site specific HASP will include but is not limited to the following general requirements.

- DOE orders (e.g., 5480.4, 5480.10 and 5480.11)
- Code of Federal Regulations (e.g., OSHA 29 CFR, EPA 40 CFR, and DOT 49 CFR)
- ACGIH threshold limit values (TLVs), latest edition
- Standard practice procedures for health and safety

This HASP will be available at PORTS for inspection by employees, their designated representatives, DOE, EPA and other authorized personnel. Specific safety and health hazards of each phase of site investigation operations and the requirements and procedures for employee protection will be provided in the site safety and health plan. The site safety and health plan complies with 29 CFR 1910.120 and must be developed and approved prior to hazardous waste operations. As a minimum, the site safety and health plan addresses the following items:

- Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer;
- Site characterization and analysis;
- A safety and health risk analysis of each site task and operation;
- Employee training;
- Selected engineering controls, administrative controls and work practices to be implemented;
- Personal protective equipment to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment used;
- Site control measures;
- Decontamination procedures;

- Site's standard operating procedures;
- A contingency plan meeting the requirements of paragraph (1) of 29 CFR 1910.120 for safe and effective responses to emergencies including the necessary personal protective equipment and other equipment; and
- Confined space entry procedures.

4.1 Objectives

This general HASP contains the requirements for protection of on-site personnel and the public during closure of the X-7725 Storage Unit at PORTS.

The protection of individuals and the environment are major concerns during any project involving potentially hazardous substances. The objective of this HASP is to assure that safe working conditions exist at the site during the field activities. Adopted safety measures and procedures have been based on an analysis of potential hazards at PORTS.

This HASP has been developed based upon a review of the requirements and guidelines described in the EPA Standard Operating Safety Guide, U.S. Department of Labor OSHA Standards 29 CFR Part 1910 (especially, 29 CFR 1910.120 covering hazardous waste operations), NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (U.S. Department of Health and Human Services Publication No. 85-115). Subcontractors will be given copies of this general HASP and will be required to follow the procedures and protocols specified herein for development and implementation of specific site safety and health plans.

Requirements of this general HASP and associated site safety and health plans may be modified, in writing, in response to review of changing site conditions upon approval by PORTS Environmental, Safety and Health (ESH) and the Site Safety and Health Officer.

4.2 Responsibilities

All closure operations which might expose personnel to site contamination are subject to this HASP. Avoiding adverse health effects and injuries to the site workers and preventing environmental insult are dependent on the contribution of all project participants.

4.2.1 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) will be responsible for providing technical coordination of the health and safety program. The officer will review documentation on medical programs and training requirements to be certain that personnel fulfill OSHA requirements. After review of the site safety and health plan's hazard assessment, the health and safety officer will select appropriate air monitoring engineering controls, work practices and personal protective equipment for particular work areas. Daily activities and site access are monitored to assure that all applicable procedures are followed. Representatives of PORTS ESH and the EPA will oversee issues relating to health and

safety. The officer provides authorized personnel with the HASP-related documentation which must be available at all work sites. This documentation includes the following:

- A copy of the physician's written opinion for each employee;
- A copy of training records, which document that each employee has completed the necessary training to accomplish the job to satisfy applicable 29 CFR and 40 CFR requirements, and is trained in the use of respiratory protection equipment;
- Documentation of the fit-testing program for respiratory protection equipment (meeting the requirements of OSHA 1910.134 and the American National Standards Institute (ANSI) Z88.2-1980);
- Job-specific (e.g., drilling, drumming waste, etc.) air monitoring records;
- A copy of this HASP and appropriate site safety and health plans; and
- Assurance that operators possess current licenses/certificates to operate motorized equipment.

The SSHO will communicate the specified safety-related requirements to all personnel during the daily safety meeting. Pre-entry briefings are held prior to initiating any site activity and at other times as necessary to ensure that employees are informed of and follow the site safety and health plan.

4.2.2 PORTS ESH

PORTS ESH is ultimately responsible for ensuring that all project participants abide by the requirements set forth in this plan. Approval of each site safety and health plan must be granted by PORTS ESH prior to initiating site operations. No individual may enter a hazardous waste site unless authorized by PORTS ESH to have site access. Such access is dependent upon presentation of satisfactory documentation including a physician's written opinion and necessary training.

PORTS ESH performs periodic audits to assure field implementation of the general HASP and site safety and health plans and reviews air and personal exposure monitoring results.

Disputes over health and safety issues will be resolved by PORTS ESH and the SSHO prior to submitting a modified HASP to Ohio EPA and U.S. EPA for review. The Ohio EPA and U.S. EPA shall also be kept informed of all changes made to the HASP.

4.2.3 Field Personnel

Field personnel must be properly trained in health and safety regulations associated with handling hazardous materials and are responsible for adherence to the safety procedures during performance of the work. In no case may work be performed in a manner that conflicts either with the intent of these procedures or with the inherent safety and environmental cautions expressed. After due

warnings, any personnel who violate safety procedures will be dismissed from the site.

4.3 Hazard Evaluation

Site-specific hazard evaluations of substances known or suspected in the X-7725 Storage Unit will be included in the site specific safety and health plan and reviewed prior to initiation of field activities. Appropriate personal protection levels, specific safety measures, and other pertinent information to be employed for the X-7725 Storage Unit closure will also be presented in the site specific health and safety plan.

4.3.1 Radiological Hazards

Radioactive materials emit one or more of four types of potentially harmful radiation: (alpha, beta, gamma and neutron). Alpha radiation has limited penetrating ability and is usually stopped by clothing and outer layers of the skin. Alpha radiation poses little threat outside the body, but can be hazardous if materials that emit alpha radiation are inhaled or ingested. Beta radiation can cause harmful "beta burns" to the skin and change the subsurface blood system. Beta radiation is also hazardous if materials that emit beta radiation are inhaled or ingested. Use of protective clothing, coupled with scrupulous personal hygiene and decontamination, afford good protection against alpha and beta radiation. In addition, use of respiratory and other protective equipment can help keep radiation-emitting materials from entering the body by inhalation, ingestion, injection, or skin absorption.

Gamma and neutron radiation easily pass through clothing and human tissue and can also cause serious permanent damage to the body. Chemical-protective clothing affords no protection against these types of radiation.

A PORTS health physicist will be consulted prior to work. At dosage-rate levels greater than 2 millirem per hour (mrem/hr) (whole body gamma radiation), all site activities shall cease until the situation has been assessed and appropriate health and safety measures have been implemented.

All workers will submit baseline and exit bioassay urine samples for total uranium, gross alpha and technetium-99. The urine specimen will represent at least a full 24-hour period. The minimum acceptable volume is 1.0 liter. Monthly specimens for the routine bioassay program will be collected on Friday or the last day of the workshift. Additional uranium bioassay samples will be collected whenever an intake above plant allowable limits may have occurred.

The purposes of the bioassay program are to confirm the results of the air sampling program and confirm the effectiveness of the respiratory protection program.

4.3.2 Chemical Hazards

Material Safety Data Sheets will be available at the job site for those chemicals utilized during closure. The SSHO will assist in identifying technical chemical hazard issues that are not addressed or are unclear on the Material Safety Data Sheets.

4.3.3 Physical Hazards

Physical hazards on the site include electric shock, tripping, falling, noise, and heat stress. To ensure a safe work place, the SSHO will conduct and document daily safety meetings and inspections. The SSHO must be familiar with OSHA construction industry and general industry standards. The SSHO shall ensure that all workers are informed of any physical hazards related to the site.

4.3.3.1 Heavy Equipment

Some general safety concerns include:

- Follow established procedures;
- Get help whenever you are in doubt about a material's weight. Use the buddy system;
- Be sure that any gas cylinders are secured properly to heavy mobile equipment;
- Hard hats and safety glasses are to be worn at all times around heavy equipment. Additional protective gear will be worn as needed;
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators;
- Only qualified/licensed people are to operate heavy equipment;
- Use chains, hoists, straps, and other safety equipment to aid in moving heavy materials consistent with hoisting and rigging standards;
- Never walk directly in back of or to the side of heavy equipment without the operators knowledge; and
- Be sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines will present a hazard in the work area.

4.3.3.2 Trenching

Not applicable.

4.3.3.3 Electrical

All electrical wiring used during the X-7725 Storage Unit closure activities will satisfy the requirements of 29 CFR 1926, Subpart K, and any applicable local electric codes. Some specific electrical safety requirements follow:

- All electrical work will follow established procedures;

- All wiring will be done by a licensed electrician;
- All extension cords must have functional grounding conductors;
- All equipment that is not "double insulated" must have a functional grounding conductor;
- All electrical cords must be in good condition;
- In lieu of a documented "assured equipment grounding conductor program," ground fault protected circuits can be utilized; and
- Electrical cords and power tools will be inspected by the SSHO prior to use on the X7725 Storage Unit closure. Workers will inspect their power tools and cords.

4.3.3.4 Tripping and Falling

Workers will be apprised of any potential trip hazards through daily tool box health and safety meetings.

Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to workers will be corrected as soon as they are identified.

4.3.3.5 Utilities and Powerlines

Not applicable.

4.3.3.6 Noise

Workers will be protected from excessive noise exposure through equipment maintenance, noise monitoring, and hearing conservation programs which comply with 29 CFR 1910.95. The daily equipment inspection will include the exhaust system; perforated exhaust pipes and mufflers will be replaced as they are discovered. Noise level surveys in work areas and around equipment will be performed regularly and documented.

Hearing protective equipment will be required whenever continuous noise levels equal or exceed 85 DBA (slow meter response) and/or impulse/impact noise exceeds current ACGIH TLVs or OSHA 1910.95.

4.3.3.7 Heat Stress

Wearing Personal Protective Equipment (PPE) puts a hazardous waste worker at risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other precautions are vital.

Heat stress may be of concern especially when the dry-bulb air temperature exceeds 70 °F. One or more of the following control measures can be used to help control heat stress if ambient temperatures above 70 °F are expected:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salt lost from sweating. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement;

- Replacement fluids can be a 0.1 percent salt water solution, commercial mixes such as Gatorade or Quick Kick, or a combination of these and fresh water;

- Establishment of a work regimen that will provide adequate rest periods for cooling down. This may require additional shifts for workers or earlier/later work schedules;

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments;

- All breaks are to be taken in a shaded rest area;

- Employees will remove impermeable protective garments during rest periods;

- Employees will not be assigned other tasks during rest periods; and

- To prevent heat stress, all employees will be informed of the importance of adequate rest, acclimatization, proper diet, health hazards, recognition of heat illness, and first aid.

Because the incident of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

- For workers wearing permeable clothing (e.g., standard cotton or synthetic work (clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Govermnental Industrial Hygienists' (ACGIH) threshold limit values for heat stress. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.

- For workers wearing semipermeable or impermeable encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70 °F.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third; or,

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.

  If oral temperature still exceeds 99.6 ° F at the beginning of the next rest period, shorten the following work cycle by one-third.

  Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

To monitor body water loss, measure weight on a scale accurate to +0.25 lb. at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and level of physical work. The length of work cycle will be governed by frequency of the required physiological monitoring.

4.3.3.8 Cold Stress

Cold stress may be of concern, especially when a wind-chill-adjusted temperature of 10 ° F or less is expected. To control cold stress:

- Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body or result in profound generalized cooling, causing death. Areas of the body which have high surface-area-to-volume ratios such as fingers, toes, and ears, are the most susceptible;

- Two factors influence the development of cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 ° F with a wind of 15 miles per hour (MPH) is equivalent in chilling effect to still air at -18°F;

- As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked;

- Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- Frostbite nip or initial frostbite: Characterized by sudden blanching or whitening of skin;
- Superficial frostbite: Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
- Deep frostbite: Tissues are cold, pale, and solid; this is an extremely serious injury.
- Systemic hypothermia is caused by exposure to freezing and rapidly dropping temperature. Its symptoms are visually exhibited in five stages: (1) shivering, (2) apathy, listlessness, sleepiness, and sometimes rapid cooling of the body to less than 95 °F, (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate, (4) freezing of the extremities, and finally, (5) death.
- Thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear can aid in the prevention of hypothermia.
- Blankets, warm drinks (other than caffeinated coffee) and warm break areas are essential.

4.3.3.9 Illumination

While work is in progress, areas accessible to employees will be illuminated not less than the intensities identified on the table located on page 4-10.

4.3.3.10 Sanitation

Provision of potable water, drinking cups, non-potable water, toilet facilities, washing facilities and other sanitation requirements will be in compliance with specifications of OSHA 1910.120 (n).

4.3.3.11 Bodies of Water

Not applicable.

4.3.3.12 Confined Space Entry

All employees required to enter into confined spaces shall observe requirements specified in ANSI Z117.1-1977 (or the latest revision thereof) and PORTS SPP H-53, "Confined Space Program." Prior to entry, employees shall have satisfactorily completed a confined space training program. Depending upon risk level, atmosphere testing for oxygen deficiency, combustible gases and toxic agents may be required. High risk entries require issuance of a hazardous work permit (HWP) by the PORTS facility custodian prior to job activities.

4.3.3.13 Site Housekeeping

Construction debris shall be handled in accordance with OSHA 1926.25.

MINIMUM ILLUMINATION INTENSITIES

FOOT-CANDLES	AREAS OR OPERATIONS
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling and field maintenance areas.
5	Indoors: warehouse, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine safety and health administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

* Table 120.1 of 29 CFR 1910.120 provides additional technical information on illumination intensities.

4.4 Air Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed at each work site. Initial air monitoring will be conducted to identify any Immediately Dangerous to Life and Health (IDLH) and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials. Then, periodic monitoring will be conducted when

- Work begins on a different portion of the site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling); and
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

4.4.1 Radioactive Materials

Radiation and radioactive contamination will be monitored using survey instruments capable of measuring low levels of activity.

Initially, at least one breathing zone air particulate sample for the employee with the highest potential exposure will be collected per work crew per work shift during activities at the site. As results are obtained, it is anticipated that the frequency of sampling during a particular activity can be reduced. The criteria for air particulate sampling and radio nuclide counting are addressed in DOE Order 5480.11.

Radioactive air particulate samples will be counted using a gas proportional counter, or alpha scintillation counter or counter with similar capabilities. As a minimum, gross alpha emitter airborne concentration and gross beta emitter airborne concentration will be determined and documented.

Preliminary samples showing activities above 25% of applicable DAC values will be composited and sent to a laboratory for identification of the isotopes present and their concentrations. In addition, whenever the time weighted average gross alpha or gross beta airborne concentration measurements indicate that airborne radio nuclide concentrations may exceed 25% of the values provided in DOE Order 5480.11, isotopic analysis will be performed. When appropriate, several filters may be submitted as a single composite sample for isotopic analysis.

4.4.2 Chemical Hazards

Air sampling and monitoring for chemical hazards will be conducted to the extent necessary to document compliance of the project with existing regulations. Monitors used will include

direct-reading instruments and sample collecting devices. Direct reading instruments to be used during the X-7725 Storage Unit closure activities may include photo ionization detectors, flame ionization detectors, colormetric tube samplers, and combustible gas/oxygen meters; sample collecting devices utilized may include filter cassettes, florisil tubes and charcoal tubes. Breathing zone samples for employees with the highest potential exposure for each contaminant will be initially taken at a minimum rate of one per work crew per shift until results obtained indicated a greater or lesser sampling frequency is warranted.

Caution must be exercised when utilizing direct-reading instruments. Since mixtures of chemicals may be encountered and direct-reading air monitoring instrument may react to the total mixture, individual concentrations of specific compounds may not be determined by these instruments. Direct-reading instruments are not to be used when negative interference is a possibility. For situations involving exclusively positive interference, it will be assumed that the mixture is made up entirely of the chemical with the lowest airborne exposure limit. This means that the composite reading obtained will be compared with lower applicable value of the ACGIH TLVs or OSHA PELs for that specific substance to determine required respiratory protection levels.

Site hazard evaluation is a dynamic and on-going process. Respiratory protection levels may change based on measured atmospheric concentrations of detected contaminants. Respiratory protection levels will be re-evaluated if chemical analytical results from samples collected during the field activities indicated that such re-evaluation is warranted; i.e., if additional compounds are detected or if airborne concentrations significantly differ from previous measurements. The results of the air monitoring will be used as on-site documentation of contaminant exposure levels and to select the appropriate level of personal protective equipment.

4.4.3 Physical Hazards

Monitoring for physical hazards will consist of on-site inspections and use of direct-reading instruments. These instruments may include sound level meters, noise dosimeters, various types of thermometers, radio frequency analyzers, illumination meters and thickness gauges.

4.4.4 Equipment Calibration and Maintenance

All monitoring equipment will be calibrated and maintained according to manufacturer's instructions.

4.5 Personal Protective Equipment

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated, or when direct contact with skin-affecting substances may occur. Full-face respirators protect lungs, gastrointestinal tract, and eyes against air toxicants. Chemical-resistance clothing protects the skin from contact with skin-destructive and absorbable chemical. Good personal hygiene limits or prevents ingestion of material.

Equipment to protect the body against contact with known or anticipated chemical hazards has been

divided into four categories according to the degree of protection afforded as outlined in OSHA 1910.120, Appendix B.

- Level A: Chemical-protective, totally-encapsulating suit; NIOSH-approved, full-face piece Self Contained Breathing Apparatus (SCBA) or combination SCBA/air line; chemical-resistance inner and outer gloves; chemical-resistant boots with steel toes and shanks; disposable protective suit, gloves and boots; and two-way radios. Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- Level B: Chemical-resistance splash suit and coveralls (e.g., PVC saranex); NIOSH approved, full-face piece SCBA or combination SCBA/air line; chemical-resistance inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection or when the atmosphere contains less than 19.5% oxygen.

- Level C: Chemical-resistant splash suit and coveralls; NIOSH-approved, full-face cartridge respirators; chemical-resistant inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the types of airborne substances are known, the concentrations measured, direct contact with exposed skin poses no hazard and the criteria for using air-purifying respirators are met.

- Level D: Coveralls (cloth), boots (leather or rubber) with steel toes and shanks, chemical resistant outer boots; and hard hat. This is primarily a work uniform providing minimal protection for situations when the atmosphere contains not known hazard. Optional items include face shield, safety glasses or goggles; gloves; and hearing protectors.

4.5.1 Respiratory Protection

The selection and use of respirators will be in accordance with the publications listed below:

- ANSI Z88.2 (1980) "Practices for Respiratory Protection."

- NIOSH/OSHA/USCG/EPA (1985) Occupational Health and Safety Guidance Manual on Hazardous Waste Site Activities. US GPO, Washington, D.C.

- 29 CFR 1910.134, "Respiratory Protection."

- 29 CFR 1926.58, "Asbestos."

The following requirements will be adhered to:

- As a minimum, only properly cleaned, maintained, NIOSH/MSHA-approved full-face air purifying respirators will be used on-site;

- Selection of respirator, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the SSHO;

- Air-purifying cartridges will be replaced on a regular basis, as determined by the SSHO;

- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of a respirator. All respirator users are required to have physicals annually with the most recent physician's written opinion permitting respirator use;

- Contact lenses are not to be worn while using any type of respiratory protection;

- Air-line respirators shall be assembled according to manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc. Though not anticipated, air-line respirators may need to be used on-site;

- Excessive facial hair (for example, beards) prohibits proper face fit and effectiveness of respirators. Persons required to wear full-face piece respirators of SCBAs must not have interfering facial hair. All personnel wearing full-face piece respirators of SCBAs will be required to be shaven to permit proper fit;

- Regular eyeglasses cannot be used with full-face respirators (they can break the facepiece seal). Inserts must be utilized;

- The respiratory protection program utilized on-site will be documented and in compliance with OSHA, 29 CFR 1910.134 and ANSI Z88.2-1980. This requires annual respirator-usage training and annual fit testing of the respiratory equipment (fit testing every 6 months if asbestos exposure is a possibility). Program documentation and employee records for training and fit testing must be reviewed and approved by ESH; and

- Where respirators are designated for protection against contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance, contaminant odor breakthrough, or other malfunction is experienced.

Based on the hazard evaluation the use of respiratory protection is anticipated to be limited for the majority of tasks involved. Level D protection (with the modifications listed in Section 4.5.2 of this HASP) has been selected for site activities unless on-site monitoring data indicates a necessity for upgrading personal protective equipment. Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the initial and ongoing job appropriate level(s) of employee protection. These monitoring procedures are discussed in Section 4.4 of this HASP (air monitoring).

4.5. Protective Clothing

Based on available health and safety information, initial protective clothing for this work shall be as follows:

- Disposable acid-resistant coveralls with hood and boot covers;
- Boots (leather or rubber) with steel toes and shanks;
- Chemical-resistant outer boots;
- Hard hat, as applicable;
- Latex inner gloves;
- Chemical-resistant outer gloves or equivalent;
- Hearing protection, as applicable;
- If not wearing a full-face piece respirator or SCBA, chemical splash goggles will be worn at all times in the work area. Contact lenses will not be permitted in the contaminated area; and
- Sleeves will be taped to gloves and cuffs taped to boots, as applicable.

Upgrading or downgrading of the selected level of protective equipment will be the decision of the SSHO based on assessment of potential hazards.

4.6 Site Control

A site control program which meets requirements specified in OSHA 1910.120(D) will be included in the site safety and health plan.

Appropriate warning signs will be posted in readily visible locations in or near contaminated work areas. Inadvertent entry by unauthorized personnel will be prevented by utilizing barricade tape to mark the boundaries of hazardous waste sites within the PORTS security fence.

Access to contaminated work areas will be restricted to persons authorized by ESH. A daily roster containing the date, the person's name, the person's signature, organization, the time of entry, and the time of exit will be kept of all persons working in such areas. Any visitors to the area must present proper identification and be authorized to be on site. Visitors must comply with all aspects of the HASP.

Each restricted access area at PORTS will be divided into three zones, an exclusion zone, a decontamination zone, and a support zone. The basic premise behind this type of procedure is to limit the transportation of contaminants to clean areas by confining and controlling activities.

4.6. Exclusion Zone

The exclusion zone includes the actual work area where contamination is likely to be the highest. This zone has the higher inhalation exposure potential and/or presents a potentially higher

probability of skin contact with cutaneous or percutaneous effecting chemicals. As its name implies, access to the exclusion zone is limited, and the exclusion zone is bounded by an access barrier. The exclusion zone is entered after donning the proper equipment and passing through the contaminant-reduction zone. The exclusion zone should be large enough to contain the working area and small enough to be easily controlled. No eating, drinking, or smoking is allowed in the exclusion zone. The hotline can be as rigid as a fence or simply signs or barrier tape. The main point is to control access into the area. Field personnel will not enter the exclusion zone alone. Entry will be in teams of at least two individuals working under the buddy system. Visitors are not permitted to enter exclusion zones.

4.6.2 Decontamination Zone

The decontamination zone includes the areas immediately surrounding the exclusion zone. This zone has the next highest inhalation hazard, but does not have a high probability of skin contact with cutaneous or percutaneous effecting chemicals. This zone is the area in which the actual decontamination of equipment and PPE takes place. As its name implies, the intent is to reduce contamination, i.e., become progressively cleaner. This means that after decontaminating auxiliary equipment, the most contaminated PPE (e.g., boots, gloves) should be doffed first, the coveralls, other PPE, and finally, the respirator. If the site is heavily contaminated, it may be necessary to have a wash station available for removing surficial contamination before starting the disrobing procedure. Visitors are not permitted to enter decontamination zones.

Personnel decontamination will be completed according to the guidance given in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Personnel and personnel protective equipment will be decontaminated using water or a mixture of detergent and water. Liquid and solid wastes generated during decontamination will be properly collected and disposed. Prior to leaving this zone, workers will be frisked for radioactive contamination.

Every attempt will be made to reduce contamination on equipment and articles to levels that are as low as reasonably practicable. Whenever possible, steam cleaning and the use of detergents and water will be used in place of solvents and chemical decontaminants. Solid and liquid wastes produced during decontamination will be collected for proper disposal.

4.6.3 Support Zone

The support zone (clean zone) covers all areas immediately outside of the decontamination zone. Adverse exposure to chemical is unlikely in this zone. This zone is usually used to store supplies and as a dressing area. Personnel or equipment which have been in the exclusion zone must be decontaminated before re-entering the support zone. Visitors may enter support zones under the following conditions:

- Visitors must be under continuing escort by personnel qualified in at least 24 hours of health and safety training for hazardous waste sites;

- Visitation occurrence is irregular or intermittent and for short-term entry only; and

- Purpose of visitation is observatory in nature or involves the performance of incidental, non-hazardous tasks.

4.7 General Work Practices

- At least one copy of this general HASP and applicable site safety and health plan will be available at each work site.

- Contaminated protective equipment, such as respirators, hoses, boots, etc., will not be removed from the exclusion zone or decontamination zone until it has been cleaned, or properly packaged and labeled.

- Food and beverages will not be permitted or consumed in the restricted-access areas. Possession or use of tobacco products and the application of cosmetics are also prohibited in these areas.

- Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

- During activities all personnel will be required to wash their hands and face before eating, drinking, smoking, or applying cosmetics.

- Portable eyewash stations will be located in the restricted-access areas near work activities.

- All personnel will be required to field wash (hands and face) as a minimum at the end of their shift before leaving the job site if they might have been contaminated. Hands and face will be washed during breaks.

- All personnel will avoid contact with potentially contaminated substances. Walking through puddles or mud and kneeling on the ground should be avoided whenever possible.

- Equipment will not be placed on possibly contaminated surfaces.

- Field personnel must observe each other for signs of toxic exposure and heat/cold illness. Indications of adverse effects include, but are not limited to:

    * Changes in complexion and skin discoloration
    * Changes in coordination
    * Changes in demeanor
    * Excessive salivation and pupillary response
    * Changes in speech pattern

- Field personnel are cautioned to inform each other of non-visual effects of illness such

    * Headaches
    * Dizziness

* Nausea
* Blurred vision
* Cramps
* Irritation of eyes, skin, or respiratory tract

4.8 Training and Information Programs

Training and information programs must comply with requirements specified in OSHA 1910.120(E) and (I). General site workers and the SSHO are required to have satisfactorily completed an off-site 40-hour health and safety training course for conducting work at hazardous waste sites and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. On-site supervisors (e.g., SSHO) responsible for employees performing hazardous waste operations are required to have also completed an 8-hour specialized course on management of such operations. Workers and supervisors must receive 8 hours of refresher training each year. At least one member of each crew will have current certificates in Cardiovascular Pulmonary Resuscitation (CPR) and first aid. Employees expected to respond to hazardous emergency situations shall have been trained in how to respond to expected emergencies.

Prior to beginning the fieldwork tasks, field personnel and subcontractors will be given a training program/briefing by the SSHO and ESH. This session will include, but is not limited to, the following topics:

- Names of SSHO and designated alternates
- Site history and site control measures
- Specific hazards (including toxicological data) and location of materials safety data sheets (MSDS).
- Hazard recognition and symptoms of overexposure
- Standard operation procedures and use of PPE and engineering controls
- Decontamination (personnel and equipment)
- Emergency procedures and locations of emergency equipment
- Respirator fit test and use
- Relevant aspects of the 29 CFR 1910.120(I)(2) site safety and health plan requirements listed at the beginning of this HASP

Throughout the course of the field program, field management personnel and the SSHO will be responsible for ensuring the implementation of and adherence to the health and safety program. In addition, the following items will be discussed during briefings between the project representative and personnel on-site. It should be kept in mind that these points are not exclusive, and any other potentially hazardous situation that may be known by the parties involved in this safety briefing should be outlined at the time of the meeting.

- Hazardous substances (suspected or known contaminated media that personnel may be exposed to)

- Hazard assessment (toxic effects, reactivity, warning signs)

- Levels of personal protection to be employed in work areas

- Work area monitoring and the atmospheric concentrations which warrant changes in the level of respiratory protection

- Personnel exposure emergency procedure (skin contact, inhalation, ingestion, falls, etc.): Notify ESH (or shift superintendent at ext. 3025)

- Potential or actual fire or explosion emergency procedure: Call emergency #5555. Relate location and status of the fire or explosion and injuries to personnel. Response will be immediate

- Potential or actual ionizing radiation exposure emergency procedure: Notify Energy Systems ESH of suspected or actual exposure to ionizing radiation (e.g., ingestion of uranium particulates). ESH will respond by notifying either the shift superintendent or health physics personnel as the situation warrants

- Environmental accidents emergency procedure (spread of contamination outside existing site): Call shift superintendent at ext.3025 and relate incident. The shift superintendent or his representative will be the authority at the site of the incident

- Emergency signals and/or codes: (See Part 4.11.2 of this section for a description of emergency alarms)

- Emergency routes: (This will depend upon worksite location)

Emergency phone number: 5555

4.9 Medical Surveillance

As a minimum, the medical monitoring program will satisfy the requirements of 29 CFR 1910 including, but not necessarily limited to, those provided in 29 CFR 1920.120 (the hazardous waste operations standard) and 29 CFR 1910.134 (the respiratory protection standard).

All participating personnel must have a copy of a written opinion from the examining physician dated not more than 12 months prior to on-site operations. This opinion includes the following:

- The results of the medical examination and tests;

- The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response;

- The physician's recommended limitations upon the employees assigned work with special emphasis on fitness for duty, including the ability to wear any required personal protective clothing and equipment under conditions (i.e., temperature extremes) that may be expected

at the work site; and

A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

4.10 Hazardous Waste Site Emergency Procedures

The SSHO shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed. The following standard emergency procedures will be used by on-site personnel.

4.10.1 Injury in Exclusion or Decontamination Zone

In the event of an injury in the exclusion zone, all site personnel shall exit the exclusion zone and assemble at the decontamination line. The on-site inspector will evaluate the nature of the injury and the affected person should be decontaminated to the extent practical prior to movement to the support zone. Appropriate first aid will be initiated, and an immediate request will be made for an ambulance (if necessary) and the designated medical facility notified (if required). No persons will re-enter the exclusion zone until the cause of injury or symptoms is determined.

4.10.2 Injury in the Support Zone

In the event an injury occurs in the support zone, the SSHO must be notified immediately. Appropriate first aid will be administered and, if necessary, the injured individual will be transported to the designated medical facility. If the injury does not affect the performance of site personnel, operations may continue.

4.10.3 Fire/Explosion

In the event of a fire or explosion at the site, the PORTS fire department will be alerted and all personnel should move to a safe distance from the area (See Section 4.11 for a list of emergency phone numbers).

4.10.4 Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and designated buddy will immediately leave the exclusion zone. Re-entry to the exclusion zone will not be permitted until functionally sound equipment has been donned.

4.11 PORTS Emergency Procedures

Emergency phone numbers and directions to the nearest medical facility will be posted at conspicuous places in the support zone. The policy at PORTS is to maintain an emergency preparedness program to provide the maximum practical protection for employees, DOE and DOE contractor personnel, members of the public, and property in the event of emergencies involving

activities on the PORTS site. Because of the nature of the facility, visitors to PORTS are always accompanied by an escort. The escort will be familiar with emergency situation response, the locations of monitoring stations, etc., and can direct visitors should an emergency situation occur. The following information is provided in case of alarms or emergencies.

4.11.1 Reporting an Emergency

Any person discovering an emergency condition at a RCRA facility should immediately alert the Plant Emergency Director (PED) and the Plant Emergency Response Team by one of the following means:

- Dial 5555 on any phone. Give your name and all vital information to the answering parties. The plan emergency squad will respond;

• Actuate a red fire alarm box - if possible wait nearby to provide the emergency squad with details of the emergency;

• Use the plant radio system to notify X-300 (plant control facility); and

• Pick up a red emergency phone. X-300 will answer. Give your name and details of the emergency.

After alerting the plant emergency director and the plant emergency response team, the person discovering the emergency should do whatever can safely be done to minimize the emergency.

In all emergencies, no matter how the alarm is initiated, it is important that the PORTS cascade coordinator is on the receiving end of an initial request for the emergency response team. The only way the coordination personnel would not be included in the initial alert sent in by one of the means above would be because of a malfunction of their equipment. Any time an alarm is received by the police or fire department and cascade coordination does not respond with immediate contact of police and fire departments, it will be assumed that cascade coordination did not receive the alarm and it will be the responsibility of the fire department captain or the police console operator to pick up the red emergency phone and include the cascade coordinator in the initial alert.

4.11.2 Recognizing Emergency Alarms

The steady sounding of sirens atop the X-330 and X-7725 building is an alert signal listen for a public address announcement.

- The wailing, or intermittent sounding of these sirens is a signal to take cover or protective action. It means an attack against our country has been detected.

- Building horns - a continuous blast means leave the building immediately and go to a monitoring station or assigned assembly point.

- Gas release sirens are local alarms. They are located at X-330 Tails and Side Feed Facilities, X-7725 ERP and PW Sampling Areas, X-700 Furnace Stand, X-342, X-344, and the HF

Storage unit Farm. When you hear a continuous modulated high-frequency siren at one of these facilities, evacuate the area and seek a position upwind.

- Any signal consisting of a series of seven short tones, sounded three times, is a request for personnel accountability. Report in person or by phone to your home base as soon as possible.

- A radiation alarm is a continuous sounding of building horns and the local radiation cluster nitrogen horns. Flashing red lights outside will be on. Immediately leave the affected building and go to a monitoring station.

4.11.3 Monitoring Station Locations

- Trailer southeast of X-100
- Fire station (X-106)
- Frame building east of X-105
- Maintenance shop in X-533 switchyard
- Inside X-630 pumphouse, north end
- Cement building south of X-530 switchyard

Additional monitoring stations will be established as needed near investigated units. Any such proposed stations will be identified in the appropriate site safety and health plan.

4.12 Records and Reporting Requirements

The contractor will notify the DOE site office, PORTS safety department, the project manager, and the responsible field manager of a fatality or serious accident, as required in DOE Order 5484.1A. Fatal accidents will be investigated by the PORTS safety department and/or DOE representatives as the situation requires.

The contractor will be responsible for the recording and reporting of illnesses and injuries in accordance with PORTS and OSHA requirements. Copies of these reports will be provided to the contractor's project files and the Portsmouth facility's safety department personnel. Recordable occupational accidents and illnesses are those defined in DOE Order 5484.1A, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements" and OSHA 29 CFR 1910 and 1926.

The contractor will submit a DOE form 5484.X "Individual Accident/Incident Report" for each occurrence for which reporting is required under DOE 5484.1A. Forms will be submitted to the Portsmouth facility's safety department and the cognizant DOE operations office. Additionally, the contractor should comply with all reporting requirements as identified in OSHA 29 CFR 1910 and 1926.

The contractor will maintain records of employee's exposures to radioactive or toxic materials or other harmful physical agents for a period of 30 years. In addition, a copy of all radiation exposures records will be transferred to the Portsmouth facility's health physics department upon employee

termination or completion of the contract. Reporting requirements of DOE Order 5484.1 will be adhered to by the contractor and Portsmouth facility.

All site workers are required by DOE Order 50003 to notify the PORTS Safety Department and cognizant DOE Site Office of any unusual occurrences. An "unusual occurrence" is any unusual or unplanned event having programmatic significance such that the event adversely affects or potentially affects the integrity of the site, the performance and reliability, or safety of the project. Notification of occurrences similar to the following will be required:

- Any substantial degradation of a barrier designed to contain radioactive or toxic material or any substantial release of radioactive or toxic material past this barrier (e.g., overflow of a water treatment pond, contaminant release into a stream, or contamination released beyond the site boundary);

- Accidents involving the transport of radioactive, hazardous, or toxic materials;

- Any fire or explosion which affects the integrity of the site or project;

- Any condition, resulting from natural events or manmade activities, which substantially affects or threatens performance, reliability, or safe operation (e.g., site flooding, wind damage, soil stability problems, personnel operation errors which create hazardous conditions);

- Any radiation or chemical exposure in excess of applicable limits;

- Any incidence or breach of access control by unauthorized personnel;

- Any acts of vandalism or major theft occurring at a site; and

- Any release of contamination outside the controlled area; including personnel, equipment, and roadways.

The contractor will maintain a central file of all enforcement inspections and reports along with violations and abatement actions that will be available for inspection by either the PORTS safety department or DOE's personnel. The contractor will also maintain a central file of formal employee health and safety complaints and reports of their disposition. Upon request, these will be made available for inspection by affected employees or their authorized representative.

The contractor will maintain documentation of all employee training, including the OSHA required 40 hours training, site specific training, new employee orientation, refresher courses, respirator fit test results, and respirator training in addition to other requirements specified by OSHA.

4.13 Complaints

A DOE Form 5480.2 (12/86) poster shall be posted at hazardous waste operation sites. Employees are encouraged to report to the SSHO either directly or through their authorized employee

representative any conditions or practices which they consider detrimental to their health or safety or which they believe are in violation of applicable health and safety standards. Such complaints may be made orally or in writing. The contractor will also have available in the workplace DOE Form F-5480.4, "Occupational Safety and Health Complaint Form," to be used in reporting violations.

Employees who believe that an imminent danger exists that threatens human or environmental health, death or serious physical harm, are encouraged to bring this matter to the immediate attention of the SSHO for resolution. In the event of the inadequate corrective action, the employee and/or authorized representative may also contact the local agency having jurisdiction, the contractor's project office, or ESH by telephone and set forth with reasonable particularity the basis for their request for an immediate inspection. Competent medical personnel, which may include a physician, will evaluate the symptoms of illnesses that could seriously affect a worker's health and safety.

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Table 1
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

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UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)

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UNIT NUMBER	UNIT TITLE
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT

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UNIT NUMBER	UNIT TITLE
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY

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UNIT NUMBER	UNIT TITLE
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING

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UNIT NUMBER	UNIT TITLE
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

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Table 2
Container Information

Volume	Type	Material	Dimensions[1]	Specification	Thickness
110 Gal.	Drum	Steel	30"id, 41"ih	49 cfr 178 Subpart d	16 gauge
85 Gal.	Drum	Steel	26"id, 36.375"ih	49 cfr 178 Subpart d	16 gauge
55 Gal.	Drum	Steel Steel ss[2] ple[3]	22.5", 35" ih 22.5"id, 35"ih 22.5"id, 35"ih 22.5"id, 35"ih	HM181,1A2 DOT17c,h,e DOT17c,e DOT34	16 16 & 18 gauge
1,2,13, 30 Gal.	Drum	ple	18.5"id, 29.75"oh (typical, 30 gal.)	DOT34	.1875"
30 Gal.	Drum	Steel ple	18.25"id, 29"oh 18.5"id 31.875"oh	DOT17h DOT34	.18"
20 Gal.	Drum	ple	21.25"id, 17.5"oh	49cfr 178 Subpart d	.1875"
5 Gal.	Pail	Steel ple	11.25"id, 13"oh	DOT17c,e DOT34	0.2"
10 Liter (2.64 Gal.)	Bottle	ple	5"id, 50"ih	Drawing no.: DX-761-2340-M	.195"
1.70 Gal.	Can	Tin	5"id *15"ih	Drawing No.: DX-761-2331-M	.010" Head .015" Body
83.7 Cu. Ft.	Box	Steel	4' X 4' X 6'	Drawing No.: DX-761-2265-M liner-10mil ple	12 Gauge
96 Cu. Ft.	Box	Steel	4' X 4' X 6'	49 cfr Subpart d	12 Gauge
275 Cu. Ft.	Box	Steel	6' X 6' X 8'	Drawing No.: DX-761-2286-M	12 Gauge
Various	Cylinder	Steel	Various	49 cfr 178 Subpart c	Various
Various	Bulk	Stainless Steel	Various	49 cfr 178 Subpart h	Various
Various	Bottle	Glass	Various	N/A	Various

1) id-inside diameter, od-outside diameter, ih-inside height, oh-outside (overall) height.
2) ss-stainless steel

SUBMISSION DATE: February 21, 2000

Table 3
Maximum Number of Containers, X-7725 Unit

Container Volume	Maximum Number
110 gallon	45,000
85 gallon	60,000
55 gallon	99,000
30 gallon	100,000
20 gallon	100,000
13 gallon	4,500
2 gallon	4,500
1 gallon	4,500
5 gallon	10,000
10 liter	10,000
1.7 gallon	10,000
83.7 cu. ft.	3,400
96 cu. ft.	3,400
275 cu. ft.	750
glass bottles	50,000
cardboard boxes	20,000
gas cylinders	1,000

SUBMISSION DATE: February 21, 2000

Table 4
X-7725 Sampling Parameter List

Inorganics	Organics
arsenic	chloromethane
barium	bromomethane
cadmium	vinyl chloride
chromium	chloroethane
lead	methylene chloride
mercury	acetone
selenium	carbon disulfide
silver	1,1-dichloroethane
	1,1-dichloroethene
cyanide	1,2-dichloroethene (total)
	chloroform
	1,2-dichloroethane
	2-butanone
	1,1,1-trichloroethane
	carbon tetrachloride
	vinyl acetate
	bromodichloromethane
	1,2-dichloropropane
	cis-1,3-dichloropropene
	trichloroethene
	dibromochloromethane
	1,1,2-trichloroethane
	benzene
	trans-1,3-dichloropropene
	bromoform
	Freon 113
	4-methyl-2-pentanone
	2-hexanone
	tetrachloroethene
	toluene
	1,1,2,2-tetrachloroethane
	chlorobenzene
	ethyl benzene
	styrene
	xylenes (total)

SUBMISSION DATE: February 21, 2000

Table 5
Gross Floor Area of X-7725 Storage Areas

X-7725 Storage Areas	Area (ft^2)
4A	17,135
4B	8389
4C	7085
4E	5964
A	55,327
B	27,171
C	28,734
D	4212
E and F (combined)	31,403
G	1938
H	5988
J	4487
K	7180
L	5640
M1	2418
M	2831
N1	11,680
N	17,544
P1	5982
P3	2444
P	5267
Q	6942
Total	265,763

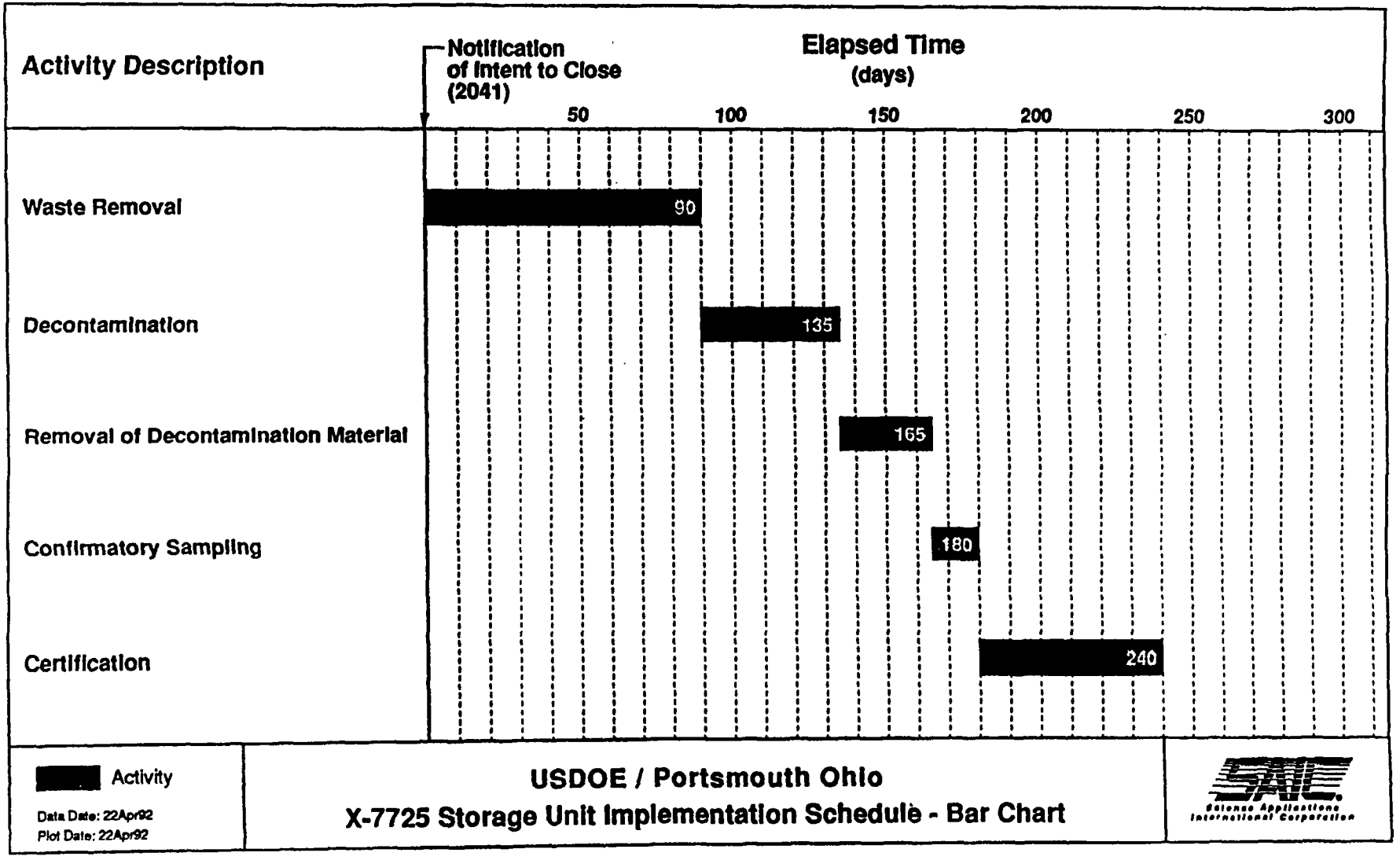

Table 6. Implementation Schedule for Closure of the X-7725 Storage Unit

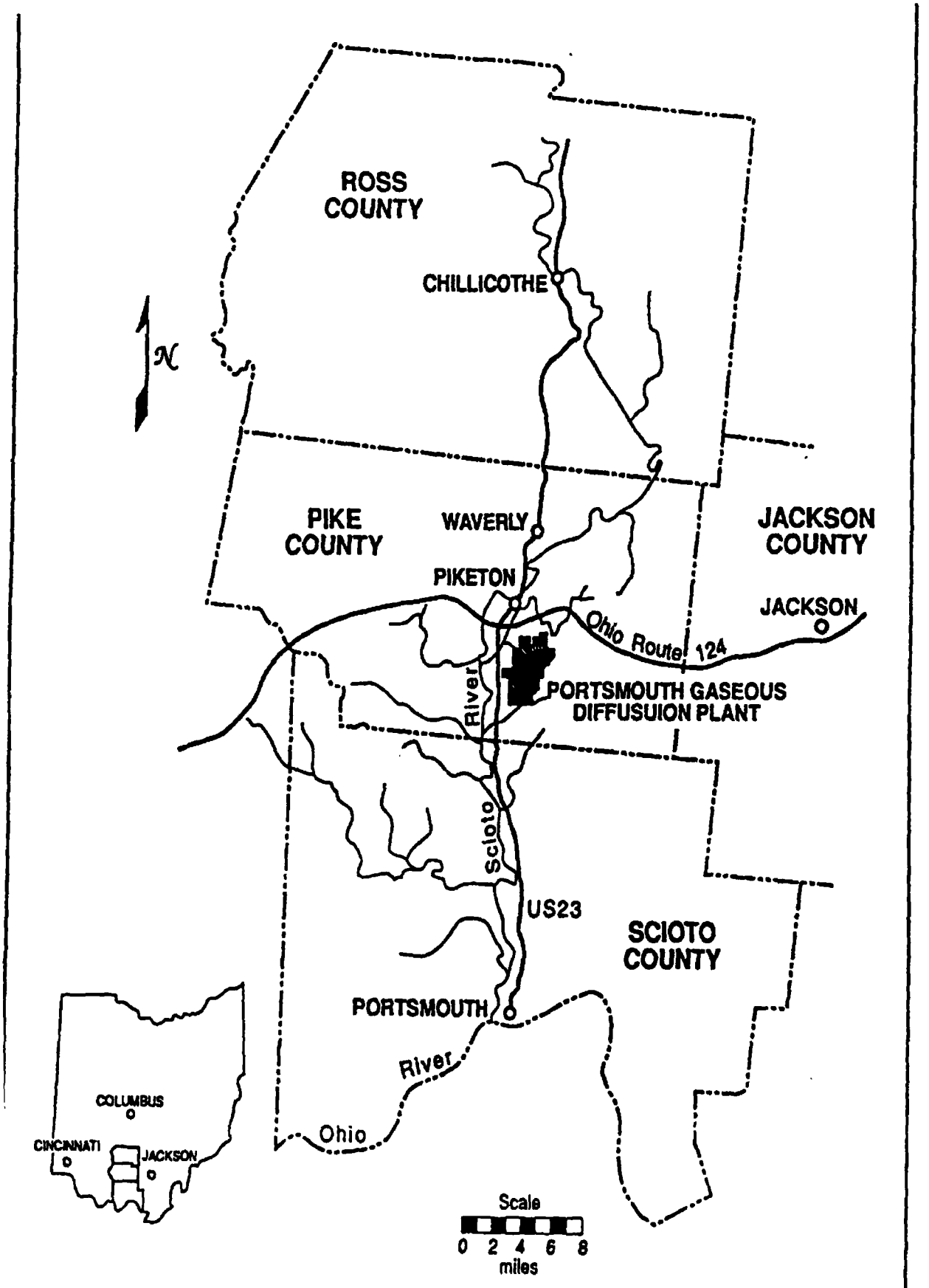

Figure 1. Location of the Portsmouth Gaseous Diffusion Plant

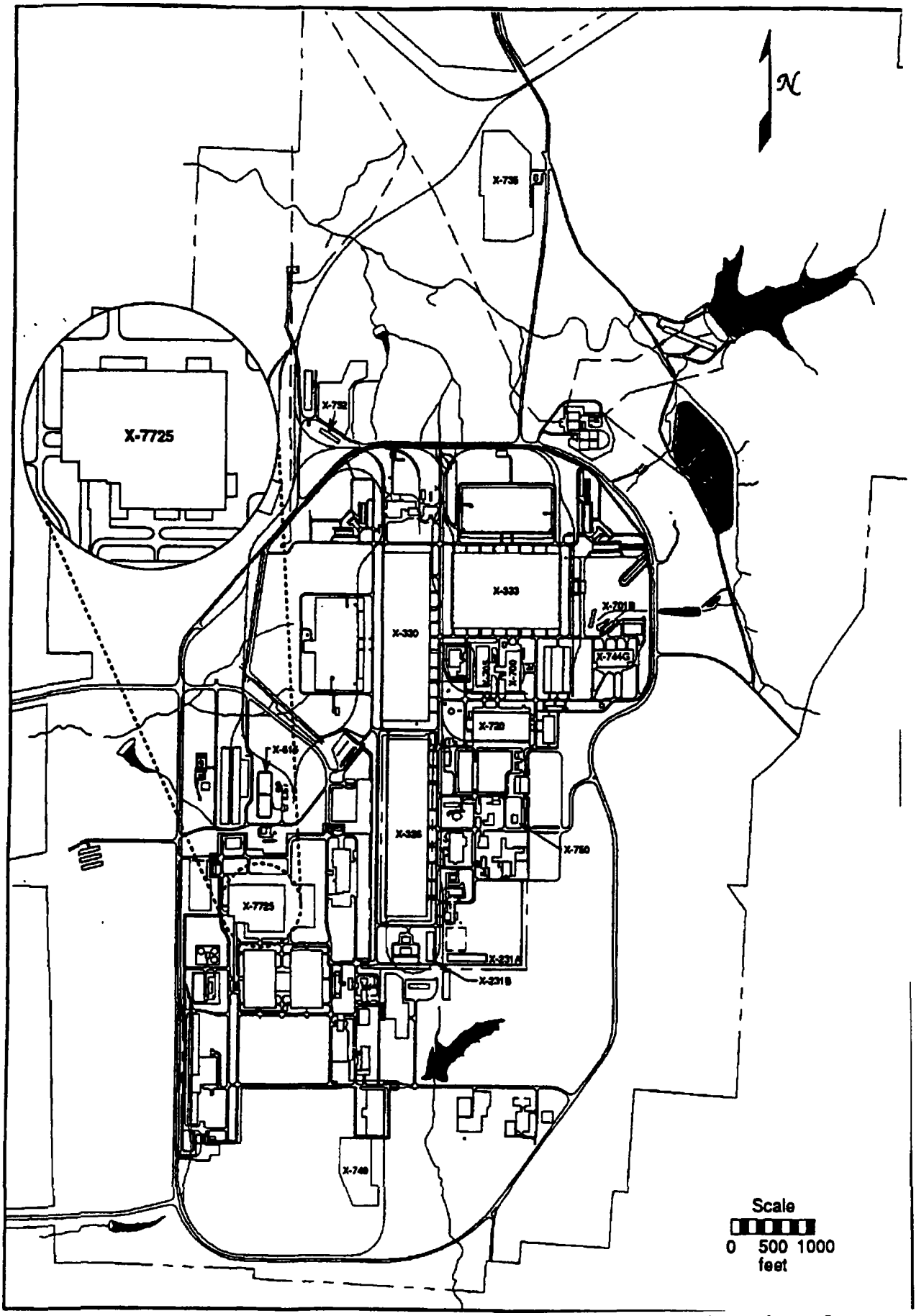

Figure 2. Location of X-7725 at the Portsmouth Gaseous Diffusion Plant

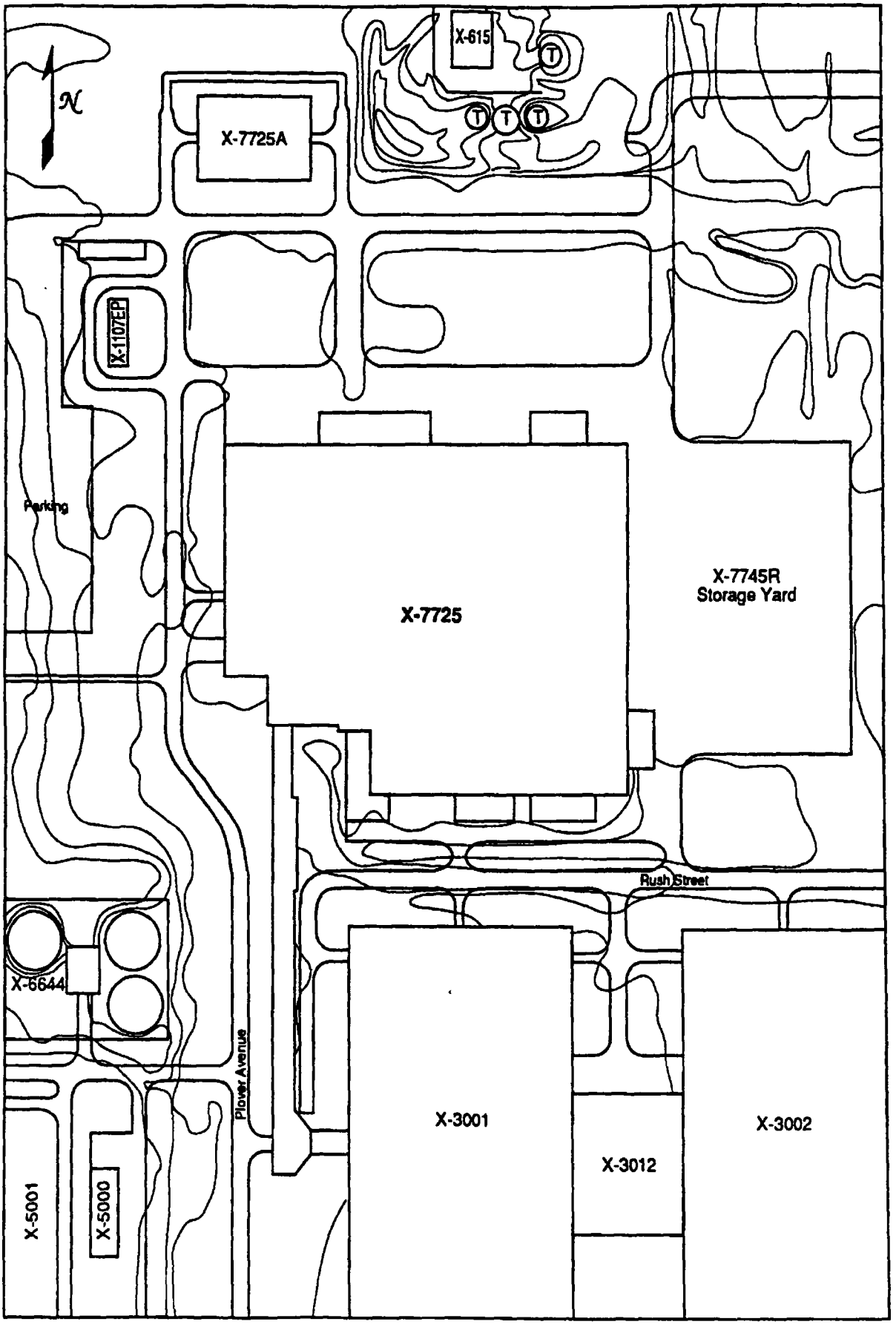

Figure 3. Topographic Details Near the X-7725 Facility

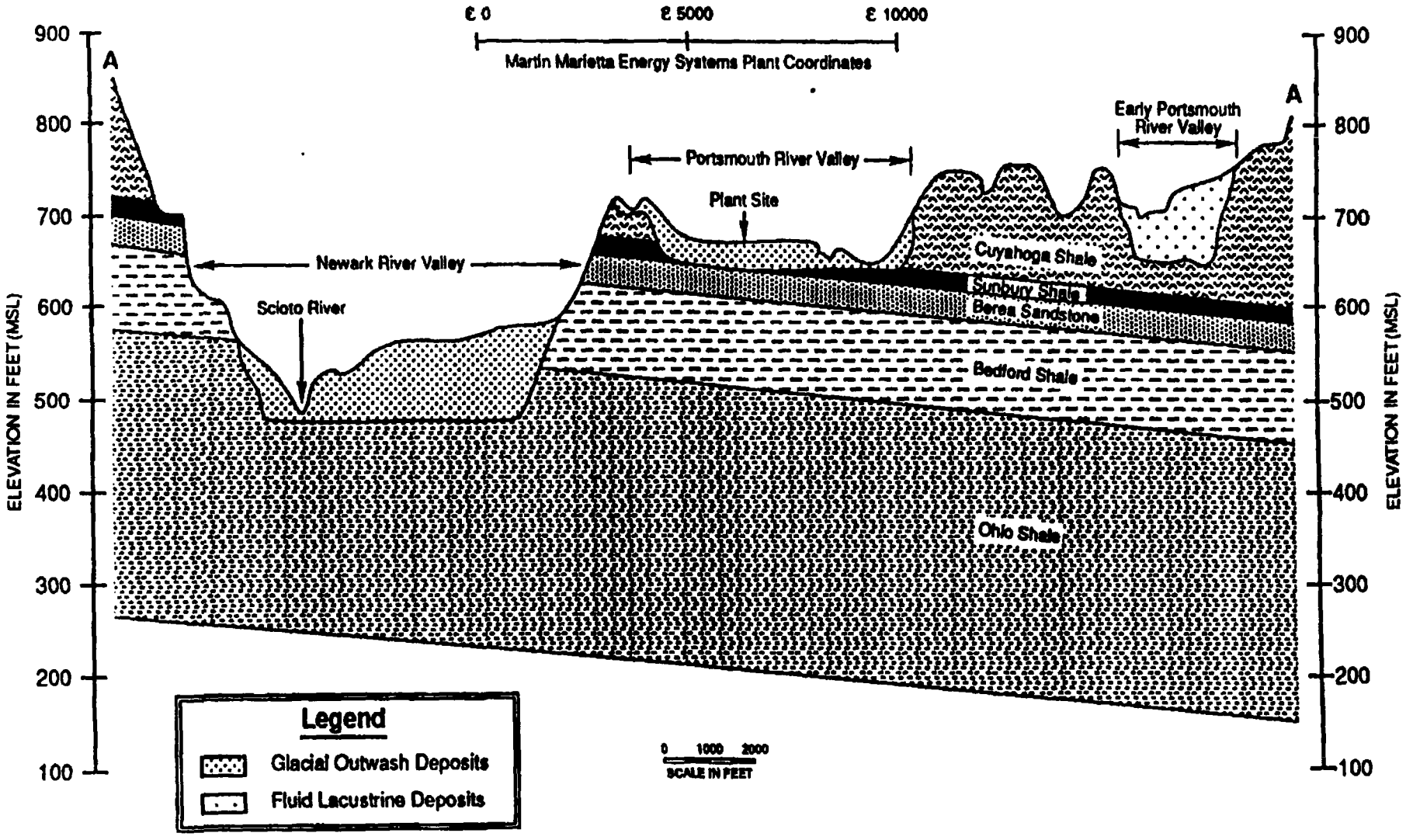

Figure 4. Regional Structral Cross Section through PORTS

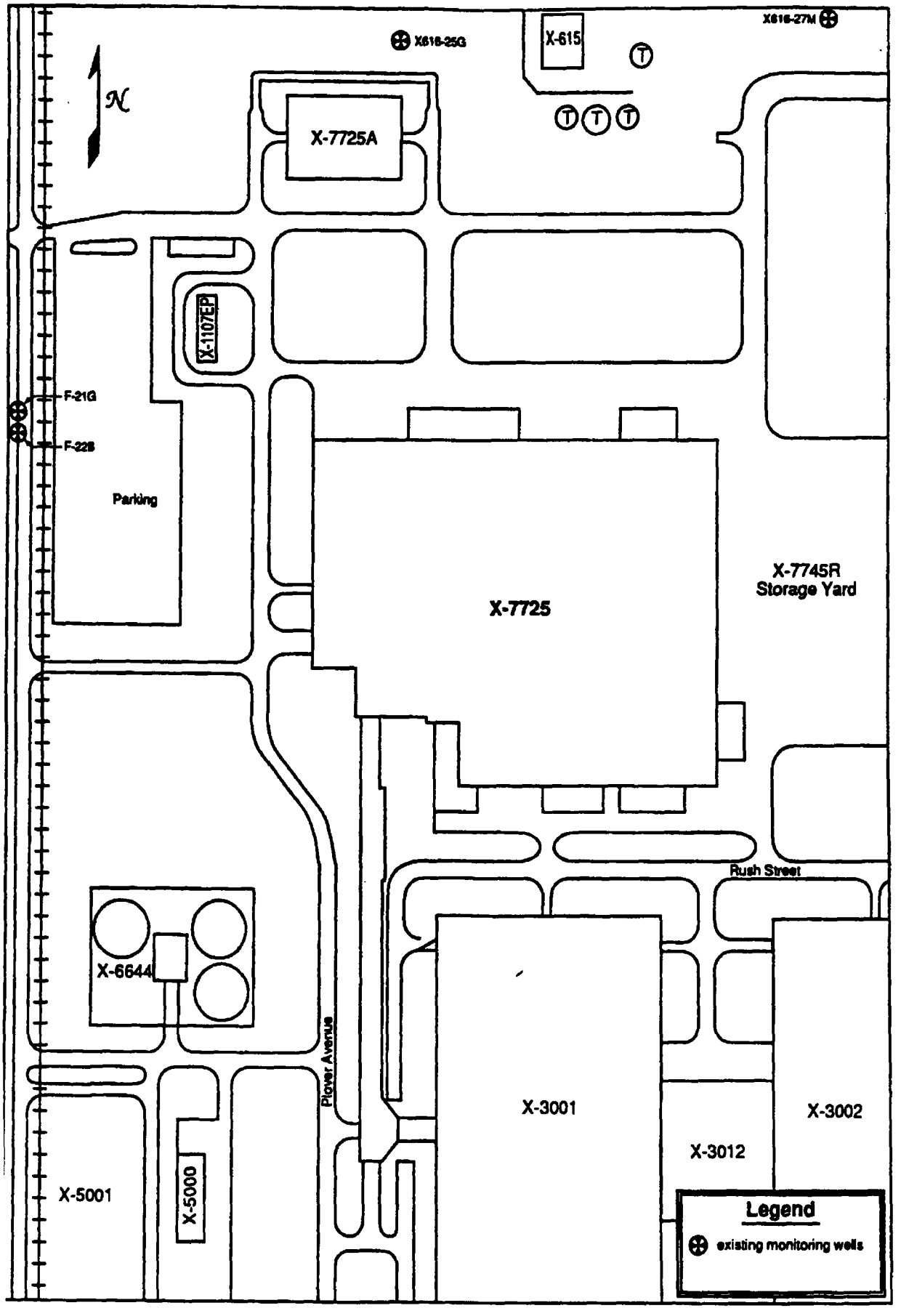

Figure 5. Well and Soil Boring Locations Near the X-7725 Storage Unit

SUBMISSION DATE: February 21, 2000

APPENDIX A

Quadrant III RFI Description of Current Conditions
Title Page and Table of Contents

SUBMISSION DATE: February 21, 2000

QUADRANT III

DESCRIPTION OF CURRENT CONDITIONS

For the

PORTSMOUTH GASEOUS DIFFUSION PLANT

PIKETON, OHIO

Operated by

MARTIN MARIETTA ENERGY SYSTEMS

For

UNITED STATES DOE

UNDER CONTRACT # DE-AC05-760R00001

Prepared By

GERAGHTY & MILLER, INC.
ENVIRONMENTAL SERVICES

6209 Riverside Dr., Suite One South
Dublin, OH 43017

May 1990

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(Continued)

SUBMISSION DATE: February 21, 2000

APPENDIX B

Stratigraphic and Construction Logs of Wells and Soil Borings in the Vicinity of the X-7725 Storage Unit

WELL F-21

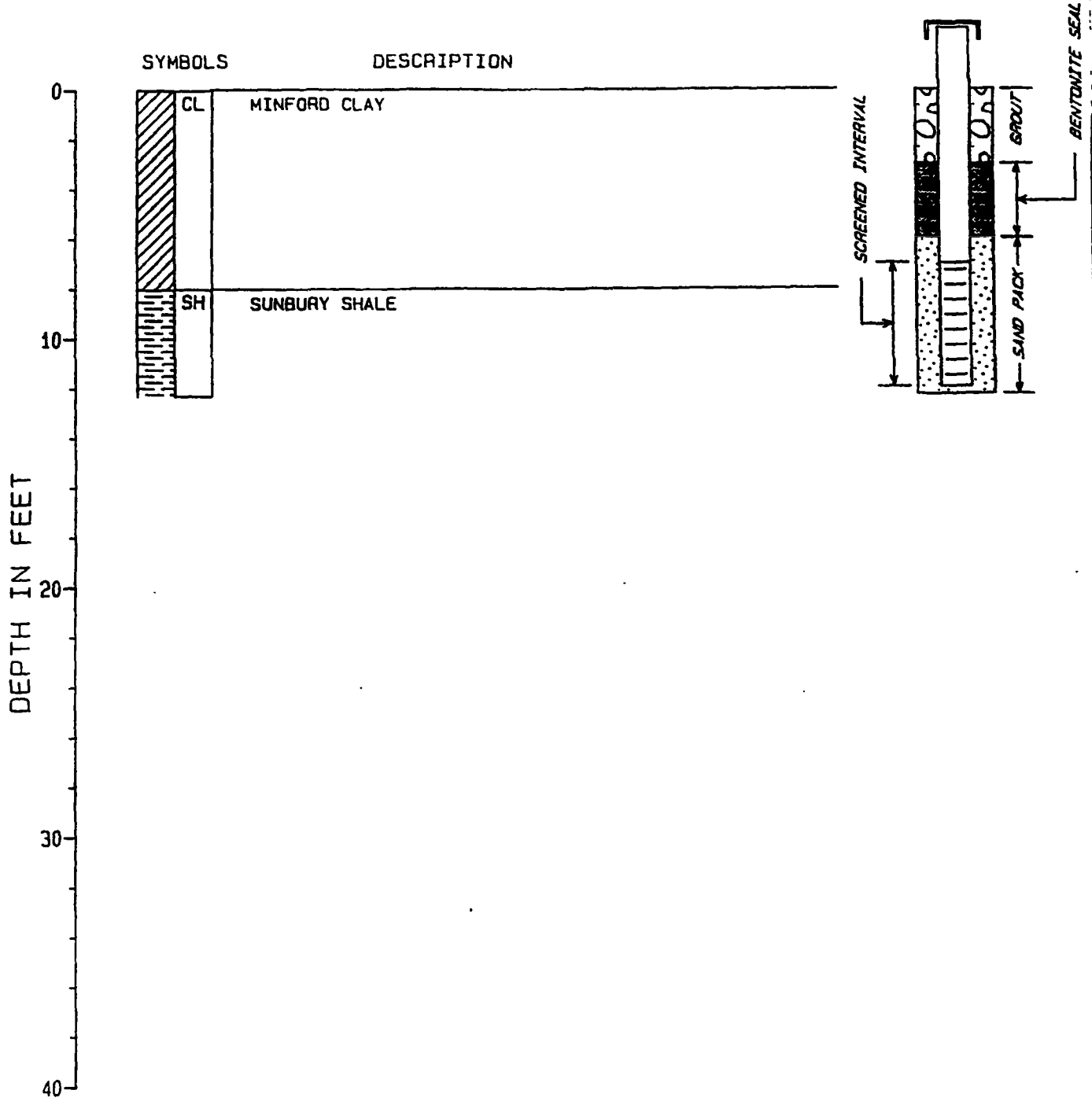
PORTS
PIKETON, OHIO

DATE DRILLED: 8/13/88

SURFACE ELEVATION: 676.93 ft. msld

TOP OF
CASING ELEVATION: 679.43 ft. msld

TOTAL DEPTH: 12.3ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL SB-25 (X616-25G)

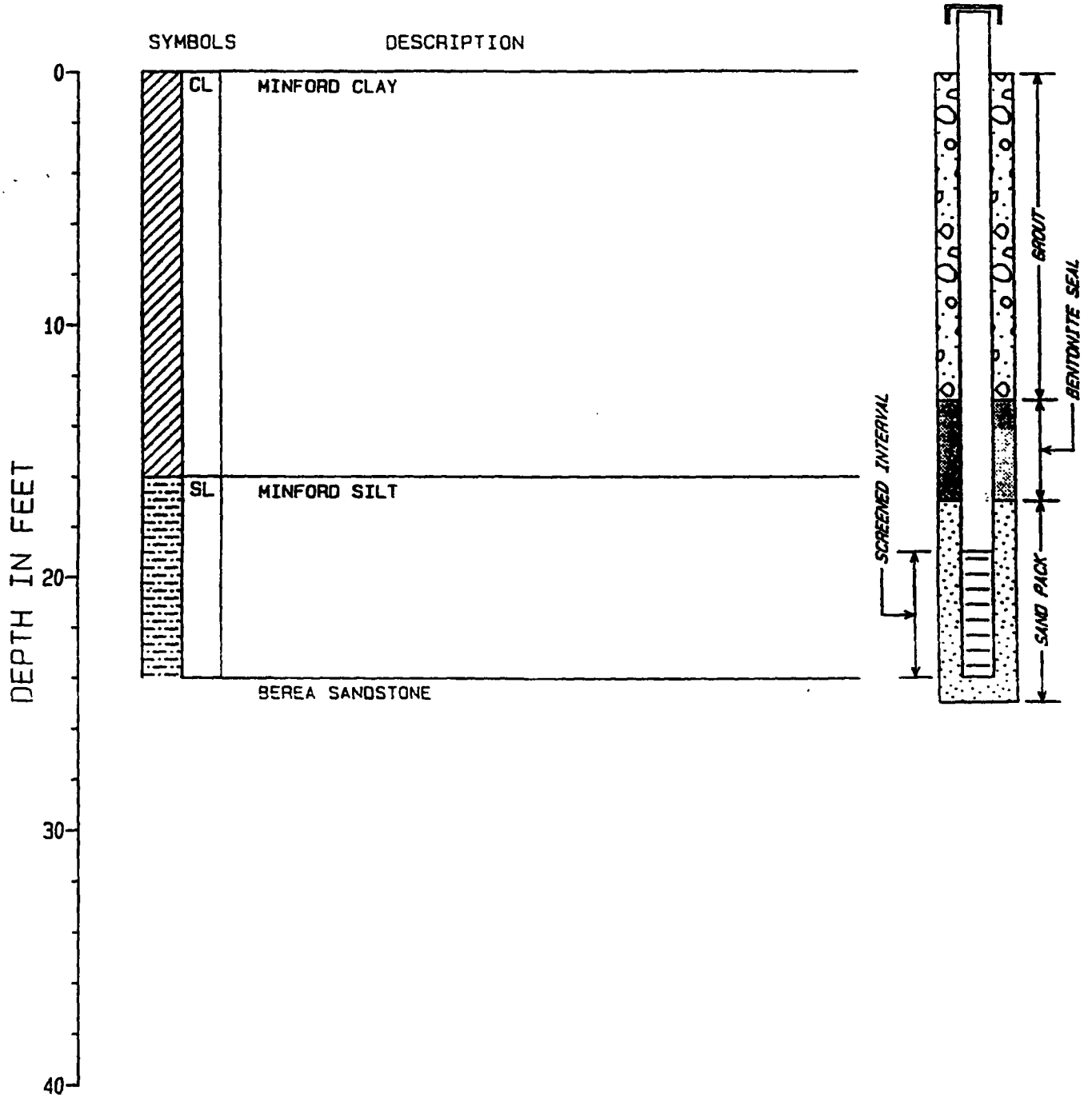
PORTS
PIKETON, OHIO

DATE DRILLED: 9/2/88

SURFACE ELEVATION: 669.68 ft. msld

TOP OF
CASING ELEVATION: 672.18 ft. msld

TOTAL DEPTH: 24.0ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL F-22

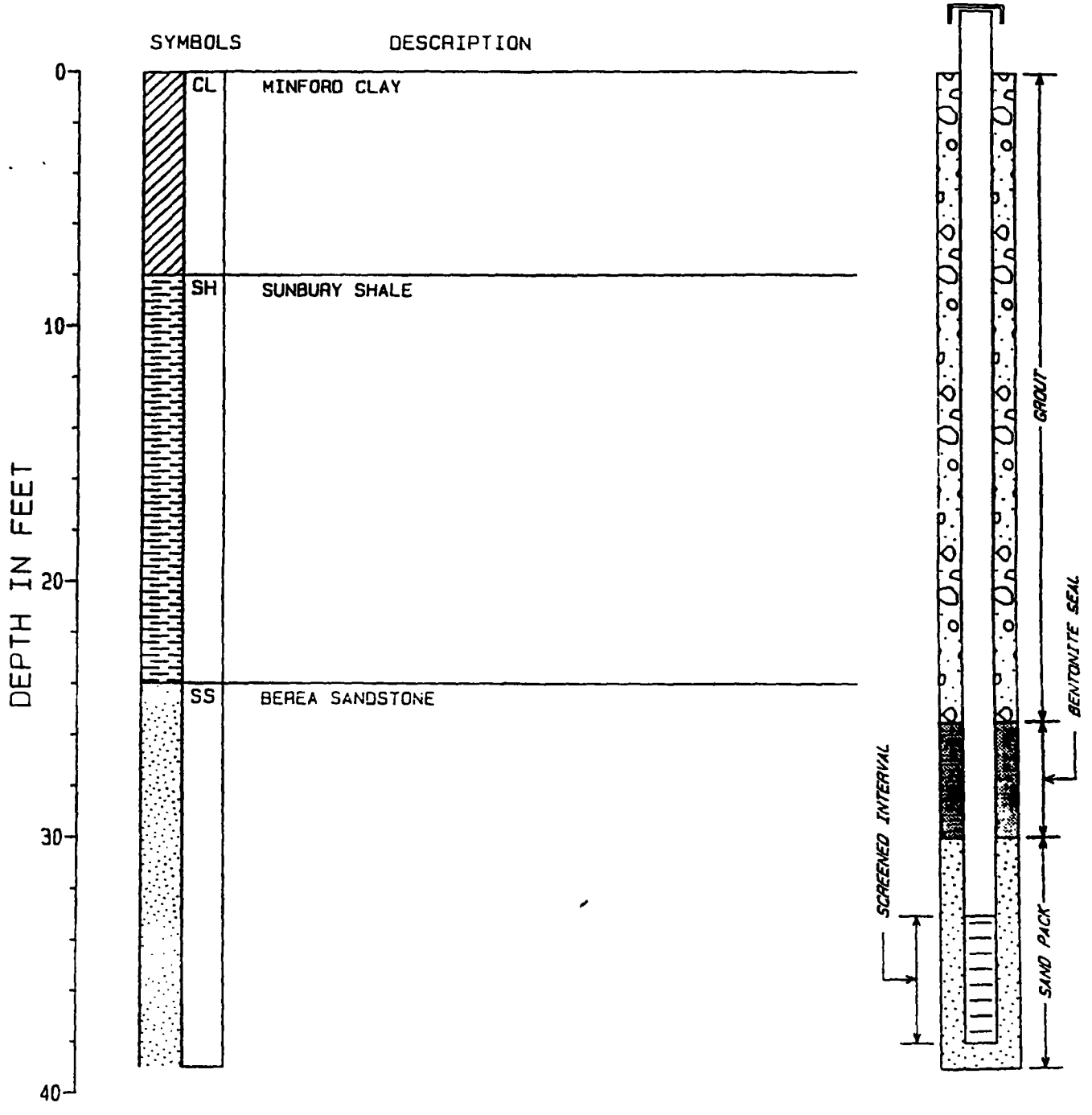
PORTS
PIKETON, OHIO

DATE DRILLED: 8/25/88

SURFACE ELEVATION: 677.68 ft. msld

TOP OF
CASING ELEVATION: 680.18 ft. msld

TOTAL DEPTH: 39.0ft. msld



WELL LOG

Geraghty & Miller Inc.

SUBMISSION DATE: 5/12/92

WELL SB-28 (X616-27M)

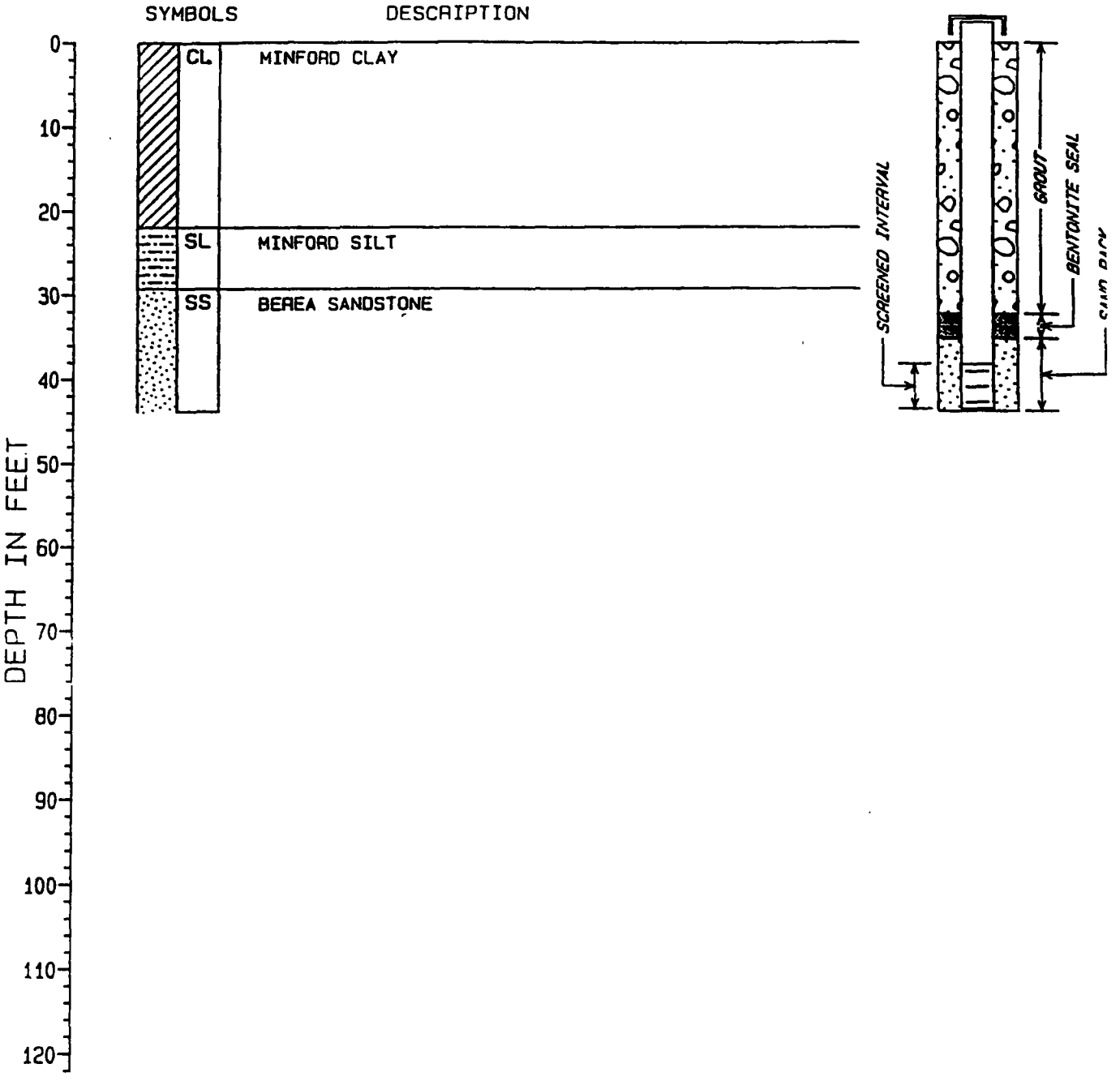
PORTS
PIKETON, OHIO

DATE DRILLED: 9/2/88

SURFACE ELEVATION: 668.97 ft. m

TOP OF
CASING ELEVATION: 671.47 ft. msld

TOTAL DEPTH: 43.9ft. msld



WELL L

Geraghty & Miller Inc.

SUBMISSION DATE: February 21, 2000

APPENDIX C

X-7725 Facility Closure Plan
Standard Operating Procedures

SUBMISSION DATE: February 21, 2000

SOP #1 - DECONTAMINATION OF TEFLON OR GLASS SAMPLING EQUIPMENT

EQUIPMENT:

_____ Micro solution
_____ Distilled water
_____ Log Book
_____ Brush

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long-term storage.

5. Record date, time and details of decontamination in log book.

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SOP #2 - DECONTAMINATION OF STAINLESS STEEL OR METAL SAMPLING EQUIPMENT

EQUIPMENT:

_____ Distilled water
_____ Brush
_____ Log Book
_____ Micro solution

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long term storage.

5. Record date, time and details of decontamination in log book.

SOP #3 - COLLECTION OF HAND-AUGERED SOIL/SEDIMENT SAMPLES

EQUIPMENT:

_____	Personal protective equipment	_____	Paperwork
_____	Plastic sheeting	_____	Pens/markers
_____	"Caution" tape and posts	_____	Sample bottles
_____	Stainless Steel Hand-Auger	_____	Waste containers
_____	Log book		

PROCEDURES:

Prior to Leaving Office:

A. Acquire necessary equipment and forms.

At Sampling Location:

1. Don appropriate PPE (See Health and Safety Plan)
2. Establish exclusion zone with barricade tape.
3. Set up monitoring equipment (PID and radiation meter)
4. Place plastic sheeting near work area.
5. Using stainless steel hand auger, collect soil or sediment samples from locations and depths prescribed in the Closure Plan.
6. Record all details of sample collection in log book.
7. Collect samples into appropriate bottles. Label each bottle with the following information: date, time of sampling, sample ID, analytical method, sampler initials and method of preservation. Print all information accurately and legibly. Complete chain-of-custody forms (see SOP #6).
8. Place samples in containers as needed, and pack with ice in coolers as soon as possible.
9. Label all waste drum(s) (see SOP #8).
10. Decontaminate the hand auger as outlined in SOP #2.

SUBMISSION DATE: February 21, 2000

SOP #4 - RINSEATE BLANK COLLECTION

EQUIPMENT:

_____ Distilled water

_____ Sample containers

_____ Log book

PROCEDURE - Re-Usable Equipment:

1. Decontaminate equipment according to SOP #1 or #2.

2. Following the final distilled water rinse, again rinse the sampling device with distilled water this time washing the rinseate into sample containers for laboratory analysis

3. All rinseate blanks must be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of rinseate blank collection in the log book.

QA/QC REQUIREMENTS:

One rinseate blank per ten investigative samples must be collected by the sampling team.

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SOP #5 - DUPLICATE SAMPLE COLLECTION

EQUIPMENT:

_____ Sample containers _____ Log book

PROCEDURE:

1. Immediately following sample collection, fill a second set of sample containers using the same order of sample collection and procedures.

2. Label the sample with its duplicate sample id.

3. All duplicate samples should be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of duplicate sample collection in the log book.

QA/QC REQUIREMENTS:

One duplicate sample per ten investigative samples must be collected by the sampling team.

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SOP #6 - CHAIN-OF-CUSTODY SAMPLE SHIPMENT PROCEDURE

PROCEDURE:

A chain-of-custody record must be completed for all samples immediately upon collection. Information to be provided on this form includes:

- Sample container volume;
- Project number and ID;
- Laboratory identification;
- Sampling personnel;
- Sample identification
- Sample container material;
- Sample preservation;
- Date and time of collection;
- Type of analysis to be performed;
- Analytical method number; and
- Shipment method and carrier

All samples should be packed in coolers with sufficient packaging to prevent damage to sample bottles during shipment. Frozen ice packs must be included in each sample cooler. Once the container is ready for shipment, a Chain-of-Custody seal should be applied in such a manner so as to monitor tampering.

Upon change of possession, the record is to be signed and dated by both parties. The white (original) copy accompanies the shipment.

SUBMISSION DATE: February 21, 2000

SOP # 7- COMPLETION OF REQUEST FOR DISPOSAL (RFD) FORMS

PROCEDURE:

1. After completing work or when drum is full, fill out RFD form items 1-2.

2. Mark RFD number on drum. If more than one drum will be accounted for on each RFD, mark the drums (i.e., 1 of 3 or 2 of 3) to ensure that all drums on each RFD form are handled.

3. Deliver all completed RFD forms to the designated waste management personnel.

SUBMISSION DATE: February 21, 2000

SOP # 8 - HNU PHOTOIONIZATION DETECTOR PROCEDURE

EQUIPMENT:

_____ HNU Model P1 101 (10.2 eV lamp)

_____ Calibrant Gases (Isobutylene: 20-200 ppm and 0-20 ppm)

_____ HNU Calibration Log

_____ Flow meter _____ Paperwork

PROCEDURES:

INSTRUMENT SET-UP:

1. Prior to calibration, check the function switch on the control panel to make sure it is in the OFF position. The probe nozzle is stored inside the instrument cover. Remove cover plate by pulling up on the pins that fasten the cover plate.

2. Remove the nozzle from the cover. Assemble probe by screwing nozzle into casing.

3. Attach probe cable to instrument box inserting 12 pin interface connector of the probe cable int the connector on the instrument panel. Match the alignment keys and insert connector. Turn connector in clockwise direction until a distinct snap and lock is felt.

4. Turn the function switch to the Battery Check position. When the battery is charged, the needle should read within or above the green battery arc on the scale plate. If the needle is below the green arc or the red LED light comes on, the instrument should be recharged prior to making any measurements.

5. Turn the function switch to the ON position. In this position, the UV light source should be on. To verify, gaze at the end of the probe for a purple glow. Do Not Look Directly at the Lamp Itself. If the lamp does not come on refer to the Instruction Manual.

6. To zero the instrument, turn the function switch to the standby position and rotate the zero potentiometer until the meter reads zero. Clockwise rotation of the zero potentiometer produces an upscale deflection while counter clockwise rotation yields a down scale deflection. (Note - No

zero gas is needed since this is an electronic zero adjustment.) If the span adjustment is changed during instrument calibration, the zero should be rechecked and adjusted. If necessary, wait 15 to 20 seconds to ensure that the zero reading is stable. Readjust as necessary.

INSTRUMENT DAILY CALIBRATION

1. Insert one end of T tube into probe. Insert second end of probe into calibration gas in the 20-200 p.m. range. The third end of probe should have the rotameter (bubble meter) attached.

2. Set the £unction switch in the 0-200 p.m. range. Crack the valve on the pressured calibration gas container until a slight flow is indicated on the rotameter. The instrument will draw in the volume required for detection with the rotameter indicating excess flow.

3. Adjust the span potentiometer so that the instrument is reading the exact value of the calibration gas. (Calibration gas value is labeled on the cylinder.)

4. Turn instrument switch to the standby position and check the electronic zero. Reset zero potentiometer as necessary following step 6 above.

5. Record on field-data sheet all original and readjusted settings.

6. Set the function switch to 0-20 p.m.. Remove the mid-range (20-200 p.m.) calibration gas cylinder and attach the low range (0-20 p.m.) calibration gas cylinder as described above.

7. Do not adjust the span potentiometer. The observed reading should be ±3 p.m. of the concentration specified for the low range calibration gas. If this is not the case, recalibrate the mid range scale repeating Step 1 thru 6 above. If the low range reading consistently falls outside the recommended tolerance range, the probe light source window likely needs cleaning. Clean window according to instruction manual. When the observed readings is within the required tolerances, the instrument is fully calibrated.

INSTRUMENT CALIBRATION CHECK:

1. Exit the exclusion zone and turn meter to "ON" position. Check that the meter is reading a value of zero.

2. Insert one end of T-tube into probe and other end into calibration gas. The third end of the T-tube should be attached to a flow meter

3. Crack the valve on the calibration gas and read the value shown by the instrument. Record the value and calibrant gas concentration and a field-data sheet.

4. If the value shown by the instrument is greater than ±20% of the calibrant gas concentration, take meter outside of exclusion zone and recalibrate as outlined above.

SAMPLE MEASUREMENT:

1. Place function switch in 0-20 p.m. range for field monitoring. This will allow for most sensitive, quick response in detecting airborne contaminants.

2. Before entering a contaminated area, determine background concentration. This concentration should be used as a reference to readings made in the contaminated area. Under no circumstance should one attempt to adjust the zero or span adjustments while the instrument is being operated in the field.

3. Take measurements in contaminated area, recording readings and locations. Should readings exceed the 0-20 scale, switch the function switch to the 0-200 or 0-2,000 range as appropriate to receive a direct reading. Return the instrument switch to the 0-20 range when readings are reduced to that level. Record measurements on field-data sheet.

Note: The instrument will not function properly in high humidity or when the window to the light housing is dirty. If the instrument response is erratic or lower than expected, recalibrate or obtain a different meter and calibrate as outlined above.

4. When finished, reverse Steps 1 thru 6 in Instrument Setup section to shut down the instrument.

QA/QC Requirements:

The instrument must undergo a 2-point calibration as described above every morning before commencement of field work. In addition, a calibration check must be performed every hour during use of the instrument. The readings from the HNU will only be used in selection of proper PPE during field work and in selecting initial field-GC analytical parameters for sample analysis in the field.

REFERENCE: Modified from TSAI, U.S.EPA Region V, QAS.

SUBMISSION DATE: February 21, 2000

SOP #9 - COMBUSTIBLE GAS INDICATOR (MSA EXPLOSIMETERS - MODEL 2A)

EQUIPMENT:

_____ Calibrant Gasses - 40% LEL (Methane 2%)
- 50% LEL (Methane 2.5%)

PROCEDURES:

INSTRUMENT SET-UP:

The MSA Explosimeter is set in its proper operating condition by the adjustment of a single control. This control is a rheostat regulating the current to the Explosimeter measuring circuit. The rheostat knob is held in the OFF" position by a locking bar. This bar must be lifted before the knob can be turned from "OFF
position.

1. Lift the end of the rheostat knob "On-OFF" bar and turn the rheostat knob one quarter turn clockwise.

This operation closes the battery circuit (there will be an initial deflection of the meter pointer). The meter pointer may move rapidly upscale and then return to a point below ZERO, or drop directly below ZERO.

2. Flush fresh air through the instrument.

The circuit of the instrument must be balanced with air free of combustible gases or vapors. Five squeezes of the aspirator bulb are sufficient to flush the combustion chamber. If a sampling line is used, an additional two squeezes will be required for each ten feet of line.

3. Adjust rheostat knob until meter pointer rests at zero.

Clockwise rotation of the rheostat knob causes the meter pointer to move up scale. A clockwise rotation sufficient to move the meter pointer considerably above zero should be avoided as this subjects the detector filament to an excessive current may shorten its life.

Note:

When the meter pointer remains below zero and cannot be brought up to ZERO even when the control rheostat is turned to its extreme clockwise position, the batteries must be replaced.

If the pointer of the indicating meter moves to the extreme right side of its scale when the instrument is turned on and cannot be adjusted to ZERO, the detector filament may be burned out and should be replaced.

INSTRUMENT USAGE:

1. Readjust meter pointer to zero if necessary by turning rheostat knob.

2. Aspirate sample through instrument until highest reading is obtained .

Approximately five squeezes of the bulb are sufficient to give maximum deflection. If a sampling line is used add two squeezes for each ten feet of line. This reading indicates the concentration of combustible gases or vapors in the sample.

INSTRUMENT DAILY CALIBRATION:

1. Attach the flow control to the calibration gas tank.

2. Connect the hose to the flow control and to the instrument inlet fitting.

3. Open the flow control valve.

4. Record the meter reading after it stabilizes. NOTE: It is not necessary to operate the aspirator bulb to obtain the calibration sample. Depending on which calibration gas is used, the instrument reading should be within one of the following ranges:

   2.0% Methane: 42 to 60%
   2.5% Methane: 54 to 75%

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Attachments for Appendix I-2

Four oversize engineering drawing were the original attachments to this closure plan. These drawing are outdated and therefore are not included with the permit renewal application. The information provided on each drawing can be obtained in other locations as listed below:

Attachment I-1 Regional Topographic Map:	See Section B, Figure B-2
Attachment I-2 PORTS SWMU Map:	See PORTS RCRA Corrective Action Program documents
Attachment I-3 X-7725 Hazardous Waste Storage Facility Floor Plan Level I:	See Section D, Figure D-1 and Appendix D-1
Attachment I-4 X-7725 Hazardous Waste Storage Facility Floor Plan Level IV:	See Section D, Figure D-2 and Appendix D-1